HVR-M15J/M15U/M15N/M15E/M15P/M15C
RMT-DS5

SERVICE MANUAL

Ver 1.2 2006.12
Revision History

How to use Acrobat Reader

US Model
Canadian Model
AEP Model
E Model
Chinese Model
Japanese Model



R MECHANISM (MDX-R201)

Link

SPECIFICATIONS	BLOCK DIAGRAMS	REPAIR PARTS LIST
MODEL INFORMATION TABLE	FRAME SCHEMATIC DIAGRAM	ADJUSTMENT
SERVICE NOTE	SCHEMATIC DIAGRAMS	INSTRUCTION MANUAL
DISASSEMBLY	PRINTED WIRING BOARDS	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

DV Digital Video Cassette   Mini DV Digital Video Cassette

DIGITAL HD VIDEOCASSETTE RECORDER

SONY®

HVR-M15J/M15U/M15N/M15E/M15P/M15C
9-852-127-11

Sony EMCS Co.

2006L0500-1

Published by Kohda TEC

These specifications are extracted from instruction manual of HVR-M15U/M15N/M15E/M15P.

ENGLISH JAPANESE

Self Diagnosis Supported model

HDV

HDV 1080i

DVCAM™

SPECIFICATIONS

System

Video/Audio recording/playing Head System
Rotating dual-head helical scan

Audio recording format (HDV)
MPEG-1 Audio Layer2
16-bit 48 kHz (stereo)
Transfer rate 384 kbps

Audio recording format (DVCAM (DV))
12-bit Fs32K (Channel 1/2, Channel 3/4)
16-bit Fs48K (Channel 1/2)

Video signal
1080/60i, NTSC color, EIA standard system
1080/50i, PAL color, CCIR standard system

Usable cassettes
Standard DVCAM cassettes with DVCAM™ mark
Mini DVCAM cassettes with DVCAM™ mark

Tape speed (HDV)
Approx. 18.812 mm/s

Tape speed (DVCAM)
Approx. 28.218 mm/s

Tape speed (DV) Approx. 18.812 mm/s

Recording/playback time (HDV)
Approx. 276 min (using PHDV-276DM)
Approx. 63 min (using PHDVM-63DM)

Recording/playback time (DVCAM)
Approx. 184 min (using PHDV-276DM)
Approx. 41 min (using PHDVM-63DM)

Recording/playback time (DV SP)
Approx. 276 min (using PHDV-276DM)
Approx. 63 min (using PHDVM-63DM)

AUDIO jacks

IN
Pin jack: –10 dBu
Impedance: Minimum 10 kΩ (kilo ohms), unbalanced
Maximum input level:
+16 dBu (approx. 5 Vrms) 60i system
+14 dBu (approx. 4 Vrms) 50i system

OUT
Pin jack
Impedance: Maximum 1 kΩ (kilo ohms)
Output level: 47 kΩ (kilo ohms) loading, unbalanced
–10 dBu (= full bit –20 dB) 60i system
–10 dBu (= full bit –18 dB) 50i system

VIDEO jacks

IN/OUT
Pin jack, unbalanced
1.0 Vp-p (75 Ω (ohms), sync negative)
Sync signal:
0.286 Vp-p (60i/NTSC)
0.3 Vp-p (50i/PAL)
Burst signal:
0.286 Vp-p (60i/NTSC)
0.3 Vp-p (50i/PAL)

S VIDEO jacks

IN/OUT
Mini DIN 4-pin, unbalanced
Luminance signal:
1.0 Vp-p (75 Ω (ohms), sync negative)
Sync signal:
0.286 Vp-p (60i/NTSC)
0.3 Vp-p (50i/PAL)
Chrominance signal:
0.286 Vp-p (60i/NTSC) (burst, 75 Ω (ohms))
0.3 Vp-p (50i/PAL) (burst, 75 Ω (ohms))

COMPONENT OUT jacks

OUT Pin jack

Output at 480i NTSC

With [BETACAM] selected in [IN/OUT REC] menu
Y: 1.0 Vp-p (with 0.286 Vp-p sync negative, output impedance 75 Ω (ohms), unbalanced)
Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p (output impedance 75 Ω (ohms), unbalanced) (75% color bars with 7.5 IRE setup)

With [SMPTE] selected in [IN/OUT REC] menu
Y: 1.0 Vp-p (with 0.3 Vp-p sync negative, output impedance 75 Ω (ohms), unbalanced)
Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p (output impedance 75 Ω (ohms), unbalanced) (100% color bars with no setup)

Output with other settings
Y: 1.0 Vp-p (output impedance 75 Ω (ohms), unbalanced)
Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p (output impedance 75 Ω (ohms), unbalanced) (100% color bars with no setup)
480i/480p:
Y: with 0.3 Vp-p sync negative
1080i:
Y/Pb/Pr: with 0.6 Vp-p 3-level sync

i HDV/DV jack

i.LINK (IEEE1394, 4-pin connector S100)

Remote control

LANC Stereo mini-minijack (ø 2.5)
CONTROL S IN Stereo minijack (ø 3.5)

General

Peak inrush current
Hot switching inrush current, measured in accordance with European standard EN55103-1 : 5.0 A (230 V)

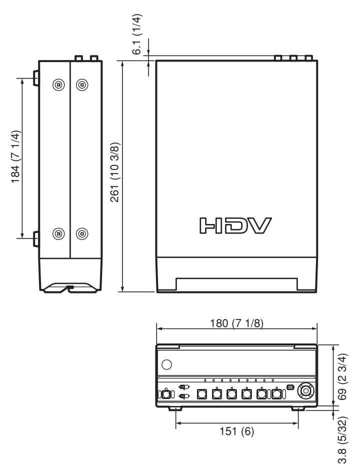
Power requirements
8.4 V (DC IN jack)

Power consumption
8 W (during playback)

Operating temperature
5 °C to 40 °C (41 °F to 104 °F)

Storage temperature
–20 °C to +60 °C (–4 °F to +140 °F)

Dimensions
Approx. 180 × 72.8 × 267.1 mm ($7\ ^1/_8 \times 2\ ^7/_8 \times 10\ ^5/_8$ inches) (w/h/d, including projecting parts and controls)



Unit: mm (inches)

Mass Approx. 2.3 kg (5 lb. 1 $^1/_8$ oz.)

Supplied accessories
Remote Commander (1)
AC adaptor (1)
Power cord (1)
Rack (1)
Size AA batteries (2)
Cleaning cassette (1)
Operating instructions (1)
See page 5-27.

AC adaptor

Power requirements
100 – 240 V AC, 50/60 Hz

Current consumption
0.35 – 0.18 A

Power consumption
18 W

Output voltage
DC OUT: 8.4 V *

Operating temperature
0 °C to 40 °C (32 °F to 104 °F)

Storage temperature
–20 °C to +60 °C (–4 °F to +140 °F)

* See the label on the AC adaptor for other specifications.

Design and specifications are subject to change without notice.

HDV 1080i

概略仕様

システム

ヘッドシステム（映像／音声、記録／再生）
　回転2ヘッドヘリカルスキャン
録音方式（HDV）MPEG-1 Audio Layer2
　16ビット48 kHz（ステレオ）
　転送レート　384 kbps
録音方式（DVCAM（DV））
　12ビットFs32K
　（チャンネル1/2、チャンネル3/4）
　16ビットFs48K（チャンネル1/2）
映像信号　1080/60i方式、NTSCカラー、EIA標準方式
　1080/50i方式、PALカラー、CCIR標準方式
使用可能カセット DVCAM マークのついた標準DVCAMカセット
　DVCAM マークのついたミニDVCAMカセット
テープ速度（HDV）
　約18.812 mm/秒
テープ速度（DVCAM）
　約28.218 mm/秒
テープ速度（DV）約18.812 mm/秒
録画・再生時間（HDV）
　276分（PHDV-276DM使用時）
　63分（PHDVM-63DM使用時）
録画・再生時間（DVCAM）
　184分（PHDV-276DM使用時）
　41分（PHDVM-63DM使用時）
録画・再生時間（DV SP）
　276分（PHDV-276DM使用時）
　63分（PHDVM-63DM使用時）

AUDIO端子

IN　ピンジャック：−10 dBu
　インピーダンス：10 kΩ以上、不平衡
　最大入力レベル：
　　60i時：＋16 dBu（約5 Vrms）
　　50i時：＋14 dBu（約4 Vrms）
OUT　ピンジャック
　インピーダンス：1 kΩ以下
　出力レベル：（47 kΩ負荷時、不平衡）
　　60i時：−10 dBu（＝フルビット −20 dB）
　　50i時：−10 dBu（＝フルビット −18 dB）

VIDEO端子

IN/OUT　ピンジャック、不平衡、
ビデオ信号　1.0 Vp-p、75 Ω、負同期
同期信号　0.286 Vp-p (60i/NTSC)
　0.3 Vp-p (50i/PAL)
バースト　0.286 Vp-p (60i/NTSC)
　0.3 Vp-p (50i/PAL)

S VIDEO端子

IN/OUT　4ピンミニDIN、不平衡
ビデオ信号　Y: 1.0 Vp-p、75 Ω、負同期
　C: 0.286 Vp-p、バースト、75 Ω (60i/NTSC)
　　0.3 Vp-p、バースト、75 Ω (50i/PAL)
同期信号　0.286 Vp-p (60i/NTSC)
　0.3 Vp-p (50i/PAL)

COMPONENT OUT端子

OUT　ピンジャック
480iNTSC出力時
[IN/OUT REC]メニューにて[BETACAM]選択時
　Y: 1.0 Vp-p
　(0.286 Vp-p負同期付き、75 Ω、不平衡)
　Pb/Cb/B-Y、Pr/Cr/R-Y: 0.7 Vp-p
　（75 Ω、不平衡）
　（7.5 IREセットアップ付き75%カラーバー時）
[IN/OUT REC]メニューにて[SMPTE]選択時
　Y: 1.0 Vp-p
　(0.3 Vp-p負同期付き、75 Ω、不平衡)
　Pb/Cb/B-Y、Pr/Cr/R-Y: 0.7 Vp-p
　(75 Ω、不平衡)
　（セットアップなし100%カラーバー時）
その他の出力の場合
　Y: 1.0 Vp-p
　(75 Ω、不平衡)
　Pb/Cb/B-Y、Pr/Cr/R-Y: 0.7 Vp-p
　(75 Ω、不平衡)
　（セットアップなし100%カラーバー時）
　480i/480pはYに0.3 Vp-p負同期付き
　1080iはY/Pb/Prに0.6 Vp-pの3値同期付き

i HDV/DV端子

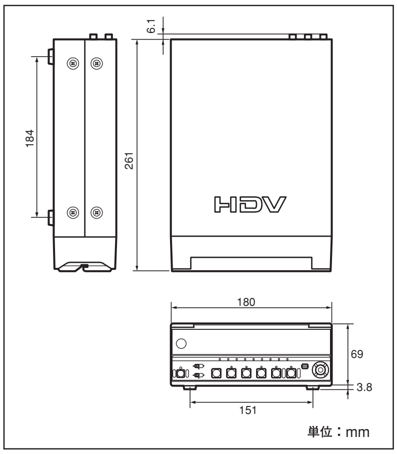
　i.LINK（IEEE1394、4ピンコネクター S100）

リモートコントロール端子

LANC　ステレオミニミニジャック（ø 2.5）
CONTROL S IN　ステレオミニジャック（ø 3.5）

電源部・その他

電源電圧　8.4 V（DC IN端子）
消費電力　8 W（再生時）
動作温度　5 ℃～ 40 ℃
保存温度　−20 ℃ ～ ＋60 ℃
外形寸法　180 × 72.8 × 267.1 mm
（最大突起含む）（幅／高さ／奥行き）



本体質量　約 2.3 kg
付属品　リモコン（1）
　ACアダプター（1）
　電源ケーブル（1）
　スタンド（1）
　単3形乾電池（2）
　クリーニングカセット（1）
　取扱説明書（1）
　保証書（1）
　ソニー業務用製品ご相談窓口のご案内（1）

AC アダプター

電源　AC100～240 V、50/60 Hz
消費電流　0.35～0.18 A
消費電力　18 W
定格出力　DC8.4 V *
動作温度　0 ℃～ 40 ℃
保存温度　−20 ℃ ～ ＋60 ℃
* その他の仕様についてはACアダプターのラベルをご覧ください。

本機の仕様および外観は、改良のため予告なく変更することがありますが、ご了承ください。

Model information table

Model	HVR-M15J	HVR-M15U	HVR-M15N	HVR-M15E	HVR-M15P	HVR-M15C
Destination	J	US, CND	E	AEP	E	CH

- Abbreviation
  AR : Argentine model
  AUS : Australian model
  BR : Brazilian model
  CH : Chinese model
  CND : Canadian model
  EE : East European model
  HK : Hong Kong model
  J : Japanese model
  JE : Tourist model
  KR : Korea model
  NE : North European model

CAUTION
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

Unleaded solder

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

LF : LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350°C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

注意
電池の交換は，正しく行わないと破裂する恐れがあります。電池を交換する場合には必ず同じ型名の電池又は同等品と交換してください。

サービス，点検時には次のことにご注意下さい。

1. **注意事項をお守りください。**
   サービスのとき特に注意を要する個所については，キャビネット，シャーシ，部品などにラベルや捺印で注意事項を表示しています。これらの注意書き及び取扱説明書等の注意事項を必ずお守り下さい。
2. **指定部品のご使用を**
   セットの部品は難燃性や耐電圧など安全上の特性を持ったものとなっています。従って交換部品は，使用されていたものと同じ特性の部品を使用して下さい。
   特に回路図，部品表に⚠印で指定されている安全上重要な部品は必ず指定のものをご使用下さい。
3. **部品の取付けや配線の引きまわしはもとどおりに**
   安全上，チューブやテープなどの絶縁材料を使用したり，プリント基板から浮かして取付けた部品があります。また内部配線は引きまわしやクランパによって発熱部品や高圧部品に接近しないよう配慮されていますので，これらは必ずもとどおりにして下さい。
4. **サービス後は安全点検を**
   サービスのために取外したネジ，部品，配線がもとどおりになっているか，またサービスした個所の周辺を劣化させてしまったところがないかなどを点検し，安全性が確保されていることを確認して下さい。
5. **チップ部品交換時の注意**
   - 取外した部品は再使用しないで下さい。
   - タンタルコンデンサのマイナス側は熱に弱いため交換時は注意して下さい。
6. **フレキシブルプリント基板の取扱いについて**
   - コテ先温度を270℃前後にして行なって下さい。
   - 同一パターンに何度もコテ先を当てないで下さい。（３回以内）
   - パターンに力が加わらないよう注意して下さい。
7. **無鉛半田について**
   無鉛半田を使用している基板には，無鉛（Lead Free）を意味するレッドフリーマークがプリントされています。
   （注意：基板サイズによっては，無鉛半田を使用していてもレッドフリーマークがプリントされていないものがあります）
   LF：レッドフリーマーク
   無鉛半田には，以下の特性があります。
   - 融点が従来の半田よりも約40℃高い。
     従来の半田こてをそのまま使用することは可能ですが，少し長めにこてを当てる必要があります。
     温度調節機能のついた半田こてを使用する場合，約350℃に設定して下さい。
     注意：半田こてを長く当てすぎると，基板のパターン（銅箔）がはがれてしまうことがありますので，注意して下さい。
   - 粘性が強い
     従来の半田よりも粘性が強いため，IC端子などが半田ブリッジしないように注意して下さい。
   - 従来の半田と混ぜて使用可能
     無鉛半田には無鉛半田を追加するのが最適ですが，従来の半田を追加しても構いません。

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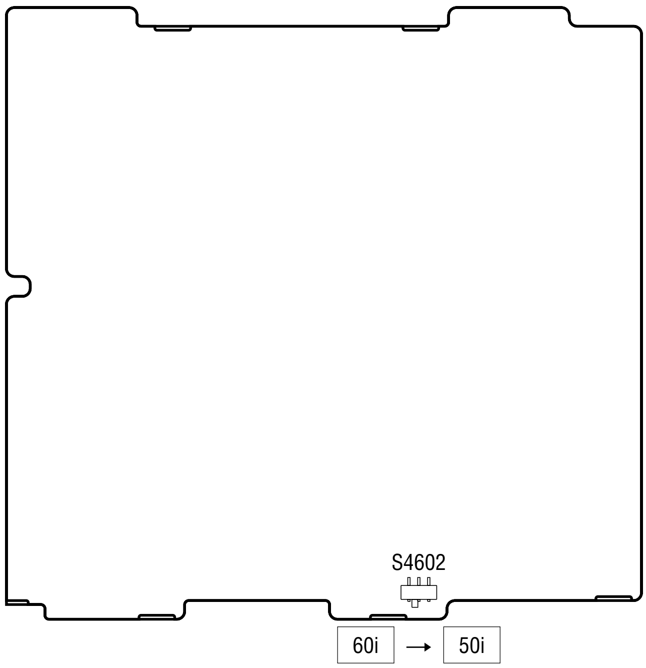
1. SERVICE NOTE

1-1. PRECAUTION ON REPLACING THE VD-036 BOARD

Set S4602 of the VD-036 board to the following position.

Switch setting
S4602 .... 60i (HVR-M15J/M15U/M15N)/50i (HVR-M15E/M15P/M15C)

VD-036 BOARD (SIDE B)



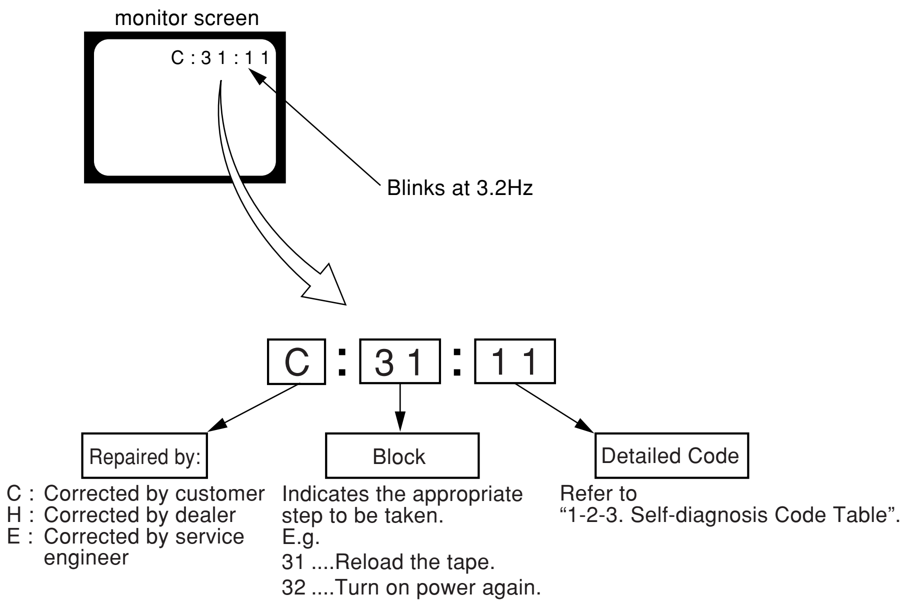
1-2. SELF-DIAGNOSIS FUNCTION

1-2-1. Self-diagnosis Function

When problems occur while the unit is operating, the self-diagnosis function starts working, and displays on the monitor screen what to do.
Details of the self-diagnosis functions are provided in the Instruction manual.

1-2-2. Self-diagnosis Display

When problems occur while the unit is operating, the time code of the monitor screen shows a 4-digit display consisting of an alphabet and numbers, which blinks at 3.2 Hz. This 5-character display indicates the "repaired by:", "block" in which the problem occurred, and "detailed code" of the problem.



1-2-3. Self-diagnosis Code Table

Self-diagnosis Code					Symptom/State	Correction
Repaired by:	Block Function		Detailed Code			
C	2	1	0	0	Condensation.	Remove the cassette, and insert it again after one hour.
C	2	2	0	0	Video head is dirty.	Clean with the optional cleaning cassette.
C	3	1	1	0	LOAD direction. Loading does not complete within specified time	Load the tape again, and perform operations from the beginning.
C	3	1	1	1	UNLOAD direction. Loading does not complete within specified time	Load the tape again, and perform operations from the beginning.
C	3	1	2	0	T reel side tape slacking when unloading.	Load the tape again, and perform operations from the beginning.
C	3	1	2	1	S reel side tape slacking when unloading.	Load the tape again, and perform operations from the beginning.
C	3	1	2	2	T reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	2	3	S reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	3	0	FG fault when starting capstan.	Load the tape again, and perform operations from the beginning.
C	3	1	3	1	FG fault during normal capstan operations.	Load the tape again, and perform operations from the beginning.
C	3	1	4	0	FG fault when starting drum.	Load the tape again, and perform operations from the beginning.
C	3	1	4	1	PG fault when starting drum.	Load the tape again, and perform operations from the beginning.
C	3	1	4	2	FG fault during normal drum operations.	Load the tape again, and perform operations from the beginning.
C	3	1	4	3	PG fault during normal drum operations.	Load the tape again, and perform operations from the beginning.
C	3	1	4	4	Phase fault during normal drum operations.	Load the tape again, and perform operations from the beginning.
C	3	2	1	0	LOAD direction loading motor time-out.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	1	1	UNLOAD direction loading motor time-out.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	2	0	T reel side tape slacking when unloading.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	2	1	S reel side tape slacking when unloading.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	2	2	T reel fault.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	2	3	S reel fault.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	3	0	FG fault when starting capstan.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	3	1	FG fault during normal capstan operations.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	4	0	FG fault when starting drum.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	4	1	PG fault when starting drum.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	4	2	FG fault during normal drum operations.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	4	3	PG fault during normal drum operations.	Remove the power cable, connect, and perform operations from the beginning.
C	3	2	4	4	Phase fault during normal drum operations.	Remove the power cable, connect, and perform operations from the beginning.

ENGLISH JAPANESE

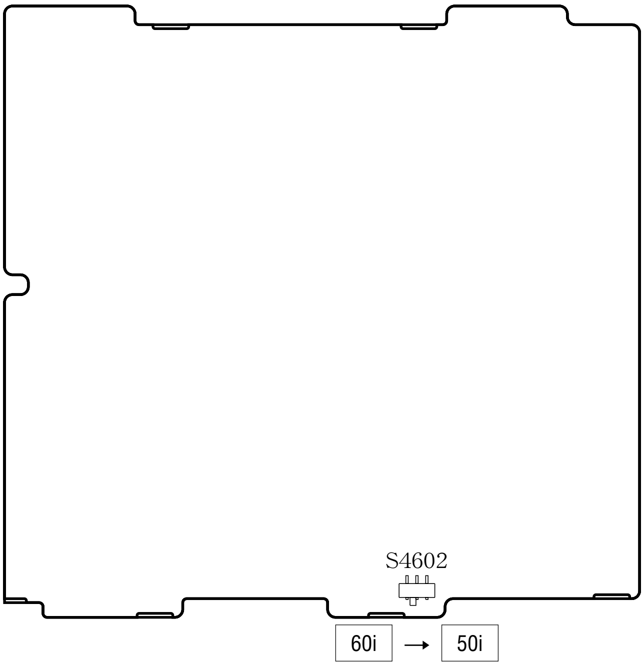
1. SERVICE NOTE

1-1. VD-036基板交換時の注意

VD-036基板のS4602は，次のように設定してください。

スイッチ設定
S4602 .... 60i（HVR-M15J/M15U/M15N）/50i（HVR-M15E/M15P/M15C）

VD−036 BOARD (SIDE B)



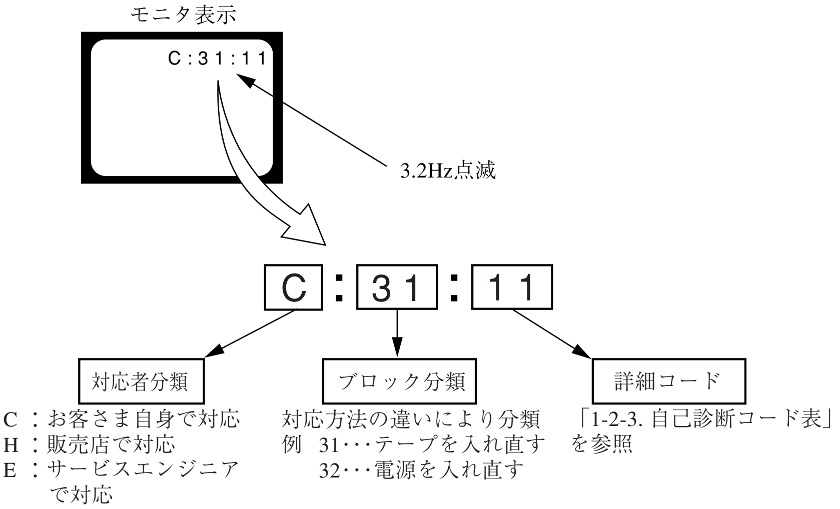
1-2. 自己診断機能

1-2-1. 自己診断機能について

本機の動作に不具合が生じたとき，自己診断機能が働き，モニタ表示に，どう処置したらよいか判断できる表示を行います。自己診断機能については取扱説明書にも掲載されています。

1-2-2. 自己診断表示

本機の動作に不具合が生じたとき，モニタ表示のタイムコード表示部分がアルファベットと数字の4桁表示になり，3.2Hzで点滅します。この5　文字の表示によって対応者分類および不具合の生じたブロックの分類，不具合の詳細コードを示します。



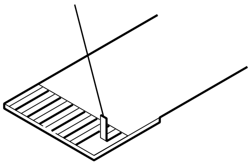
1-2-3. 自己診断コード表

自己診断コード					症状／状態	対応／方法
対応者	ブロック機能		詳細コード			
C	2	1	0	0	結露している	カセットを取り出して，約１時間してからもう一度入れ直す
C	2	2	0	0	ビデオヘッドが汚れている	別売のクリーニングカセットできれいにする
C	3	1	1	0	LOAD方向，ローディング所定時間内終了せず	テープを入れ直し，再度操作し直す
C	3	1	1	1	UNLOAD方向，ローディング所定時間内終了せず	テープを入れ直し，再度操作し直す
C	3	1	2	0	UNLOAD時，Tリール側テープ弛み	テープを入れ直し，再度操作し直す
C	3	1	2	1	UNLOAD時，Sリール側テープ弛み	テープを入れ直し，再度操作し直す
C	3	1	2	2	Tリール異常	テープを入れ直し，再度操作し直す
C	3	1	2	3	Sリール異常	テープを入れ直し，再度操作し直す
C	3	1	3	0	キャプスタン起動時FG異常	テープを入れ直し，再度操作し直す
C	3	1	3	1	キャプスタン定常時FG異常	テープを入れ直し，再度操作し直す
C	3	1	4	0	ドラム起動時FG異常	テープを入れ直し，再度操作し直す
C	3	1	4	1	ドラム起動時PG異常	テープを入れ直し，再度操作し直す
C	3	1	4	2	ドラム定常時FG異常	テープを入れ直し，再度操作し直す
C	3	1	4	3	ドラム定常時PG異常	テープを入れ直し，再度操作し直す
C	3	1	4	4	ドラム定常時位相異常	テープを入れ直し，再度操作し直す
C	3	2	1	0	LOAD方向，ローディング所定時間内終了せず	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	1	1	UNLOAD方向，ローディング所定時間内終了せず	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	2	0	UNLOAD時，Tリール側テープ弛み	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	2	1	UNLOAD時，Sリール側テープ弛み	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	2	2	Tリール異常	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	2	3	Sリール異常	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	3	0	キャプスタン起動時FG異常	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	3	1	キャプスタン定常時FG異常	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	4	0	ドラム起動時FG異常	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	4	1	ドラム起動時PG異常	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	4	2	ドラム定常時FG異常	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	4	3	ドラム定常時PG異常	電源ケーブルを外して付け直し，再度操作し直す
C	3	2	4	4	ドラム定常時位相異常	電源ケーブルを外して付け直し，再度操作し直す

2. DISASSEMBLY

NOTE FOR REPAIR

- Make sure that the flat cable and flexible board are not cracked of bent at the terminal.
  Do not insert the cable insufficiently nor crookedly.
- When remove a connector, dont' pull at wire of connector. It is possible that a wire is snapped.
- When installing a connector, dont' press down at wire of connector.
  It is possible that a wire is snapped.



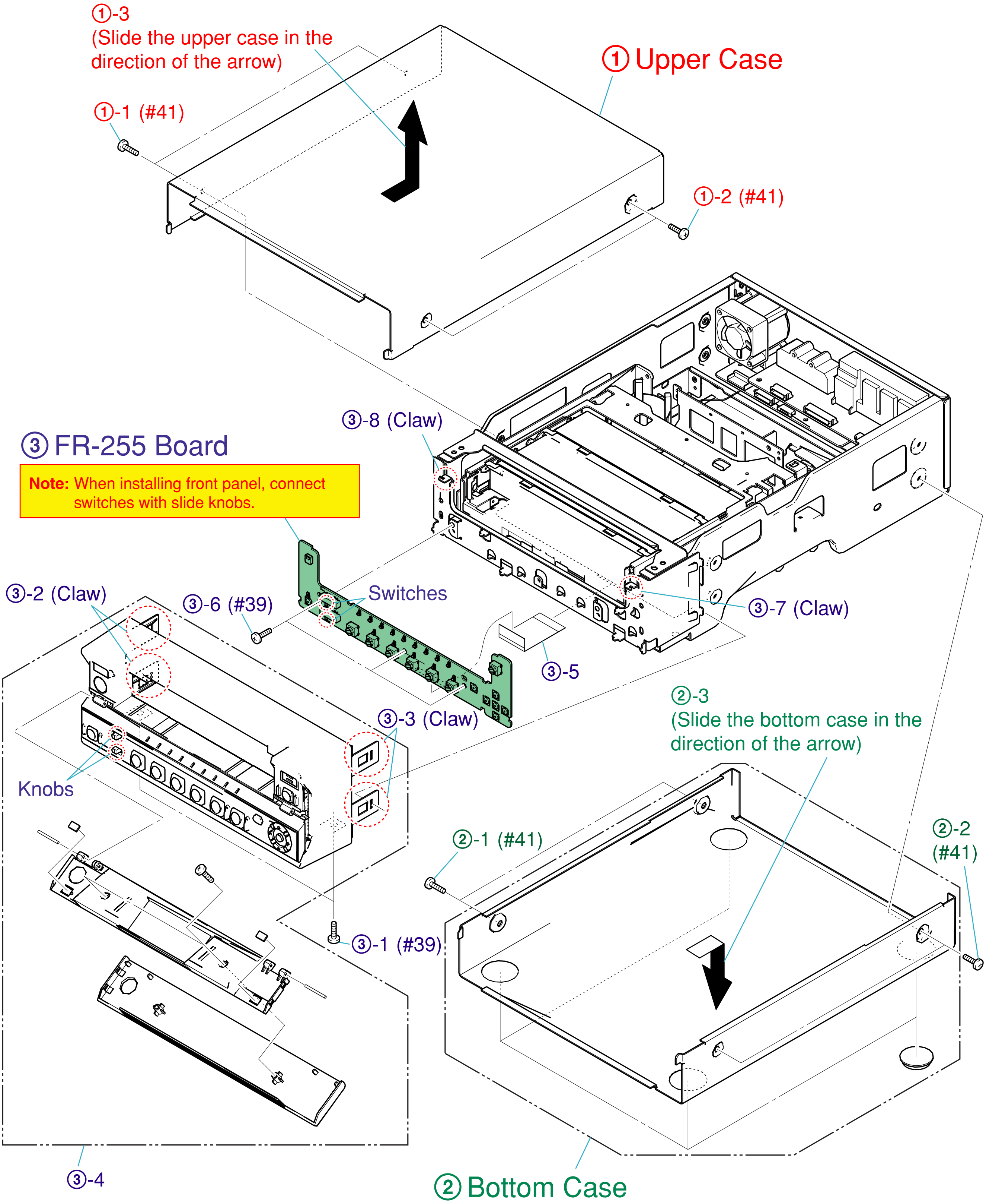
2-1. DISASSEMBLY

EXPLODED VIEW HARDWARE LIST

2-1-1. OVERALL ASSEMBLY

Follow the disassembly in the numerical order given.

① Upper Case (①-1 to ①-3)
② Bottom Case (②-1 to ②-3)
③ FR-255 Board (③-1 to ③-8)

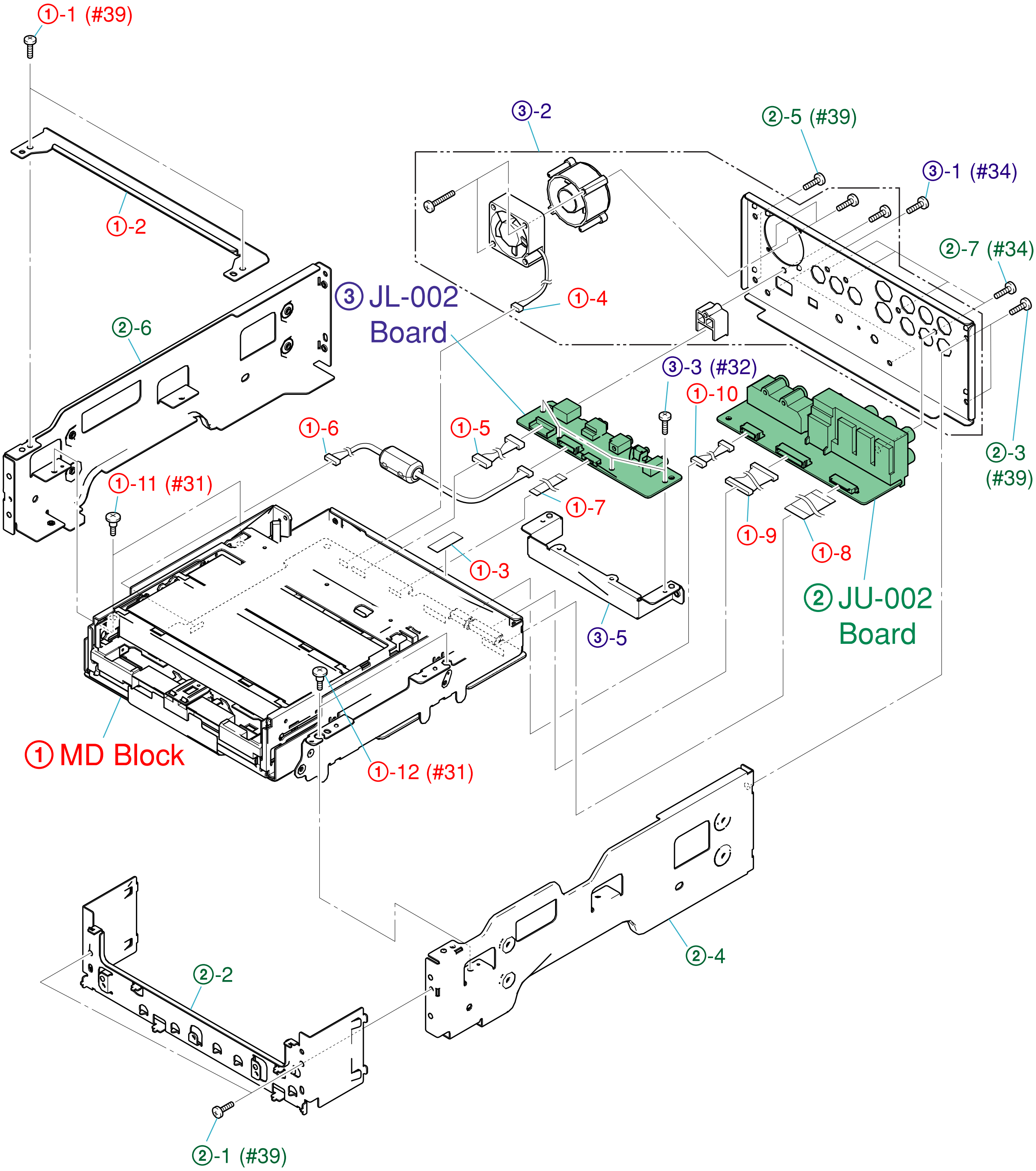


2-1-2. CHASSIS BLOCK

EXPLODED VIEW | HARDWARE LIST

Follow the disassembly in the numerical order given.

① MD Block (①-1 to ①-12)
② JU-002 Board (②-1 to ②-7)
③ JL-002 Board (③-1 to ③-5)



2-1-3. MD BLOCK

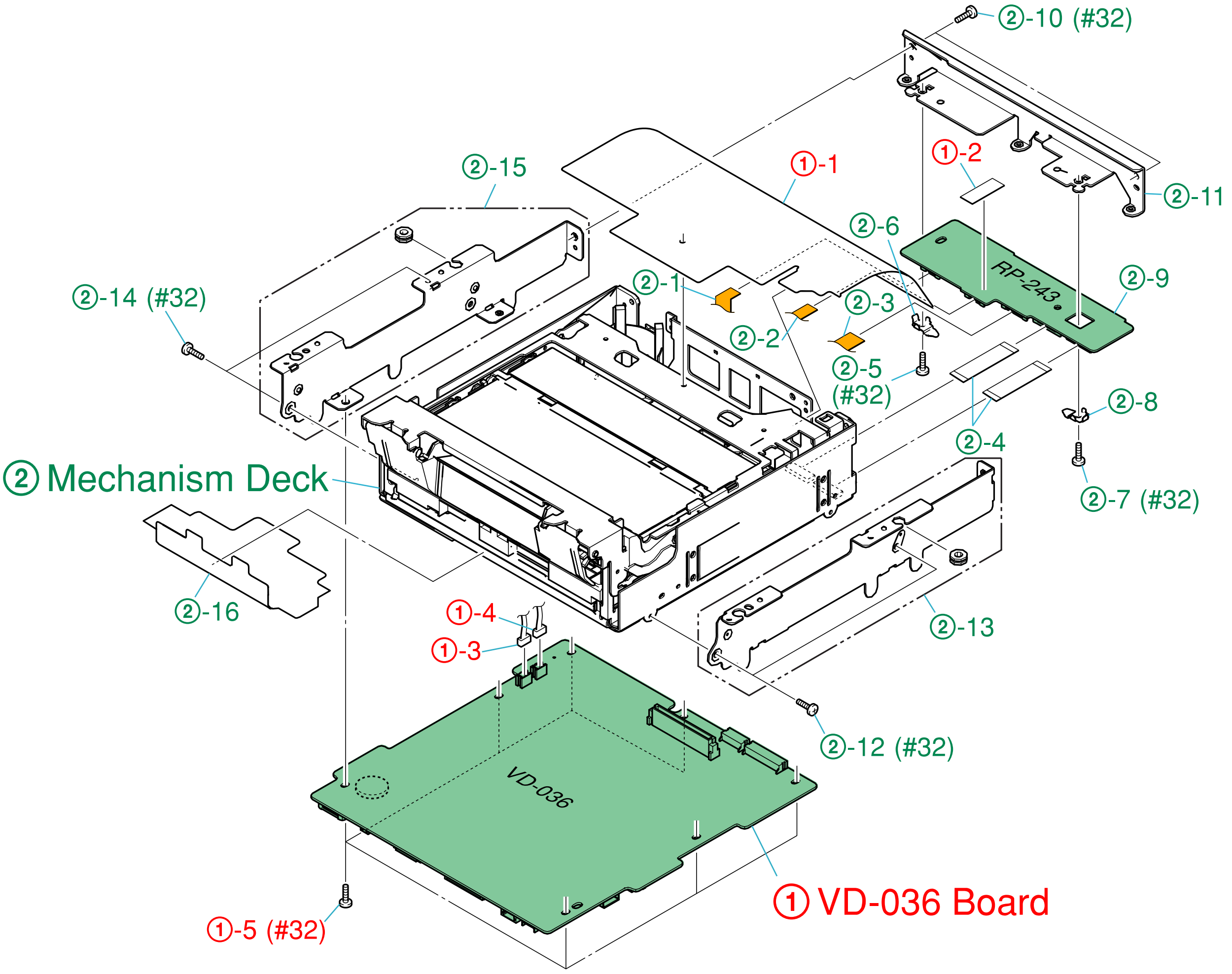
Follow the disassembly in the numerical order given.

① VD-036 Board (①-1 to ①-5)

② Mechanism Deck (②-1 to ②-16)

EXPLODED VIEW

HARDWARE LIST



3. BLOCK DIAGRAMS

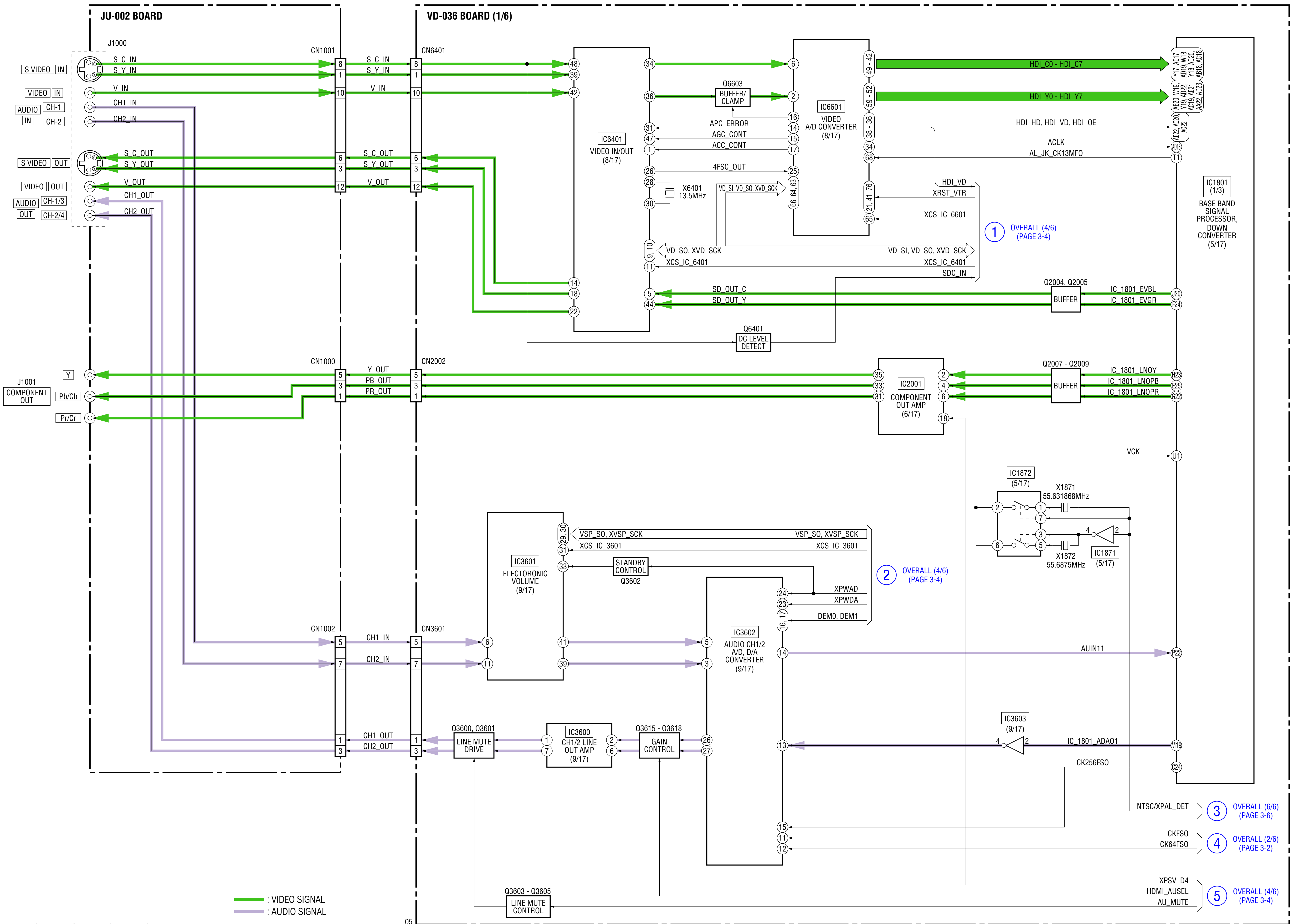
Link

OVERALL BLOCK DIAGRAM (1/6)	OVERALL BLOCK DIAGRAM (6/6)
OVERALL BLOCK DIAGRAM (2/6)	POWER BLOCK DIAGRAM (1/3)
OVERALL BLOCK DIAGRAM (3/6)	POWER BLOCK DIAGRAM (2/3)
OVERALL BLOCK DIAGRAM (4/6)	POWER BLOCK DIAGRAM (3/3)
OVERALL BLOCK DIAGRAM (5/6)	

3. BLOCK DIAGRAMS

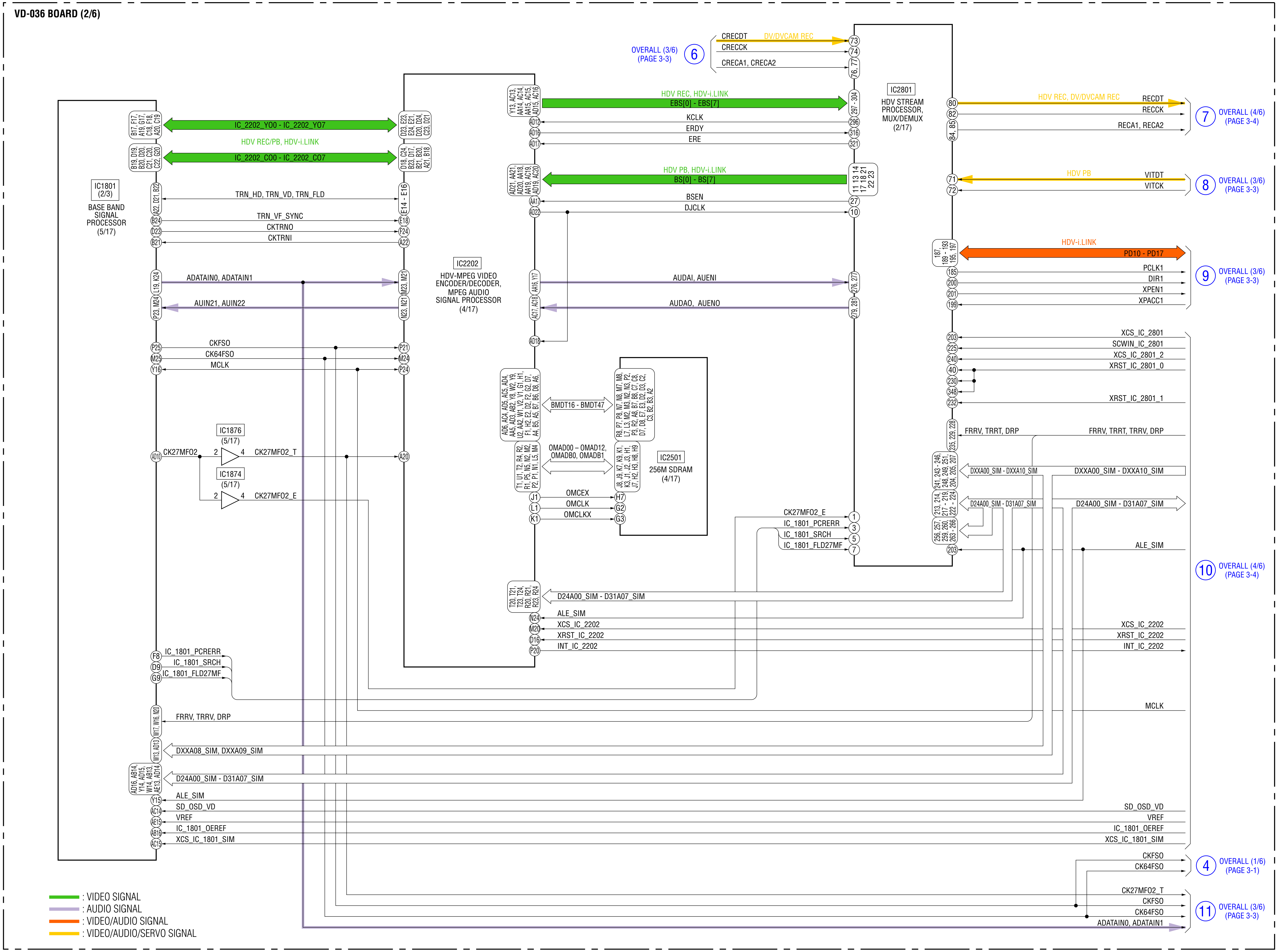
3-1. OVERALL BLOCK DIAGRAM (1/6)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.



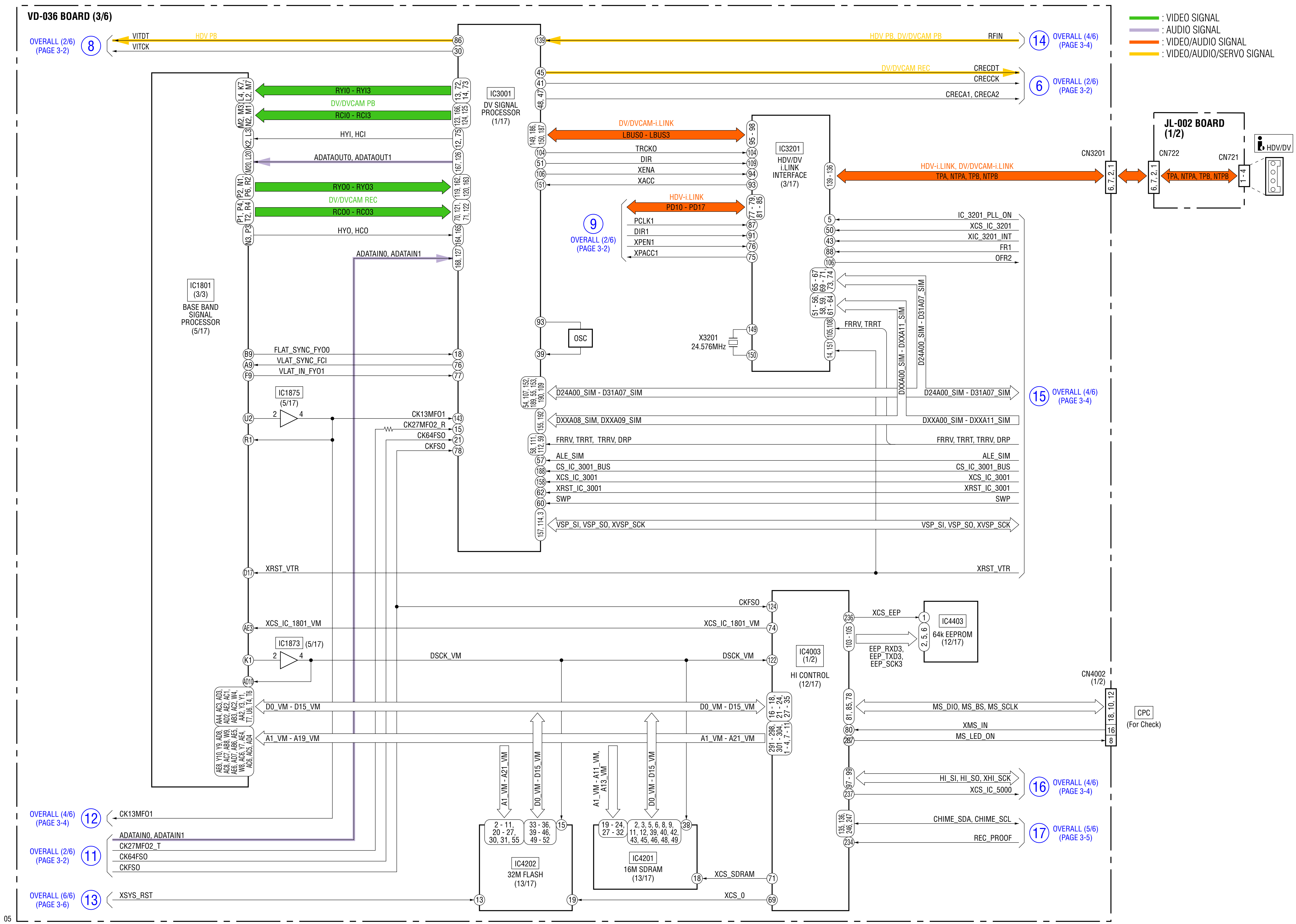
3-2. OVERALL BLOCK DIAGRAM (2/6)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.

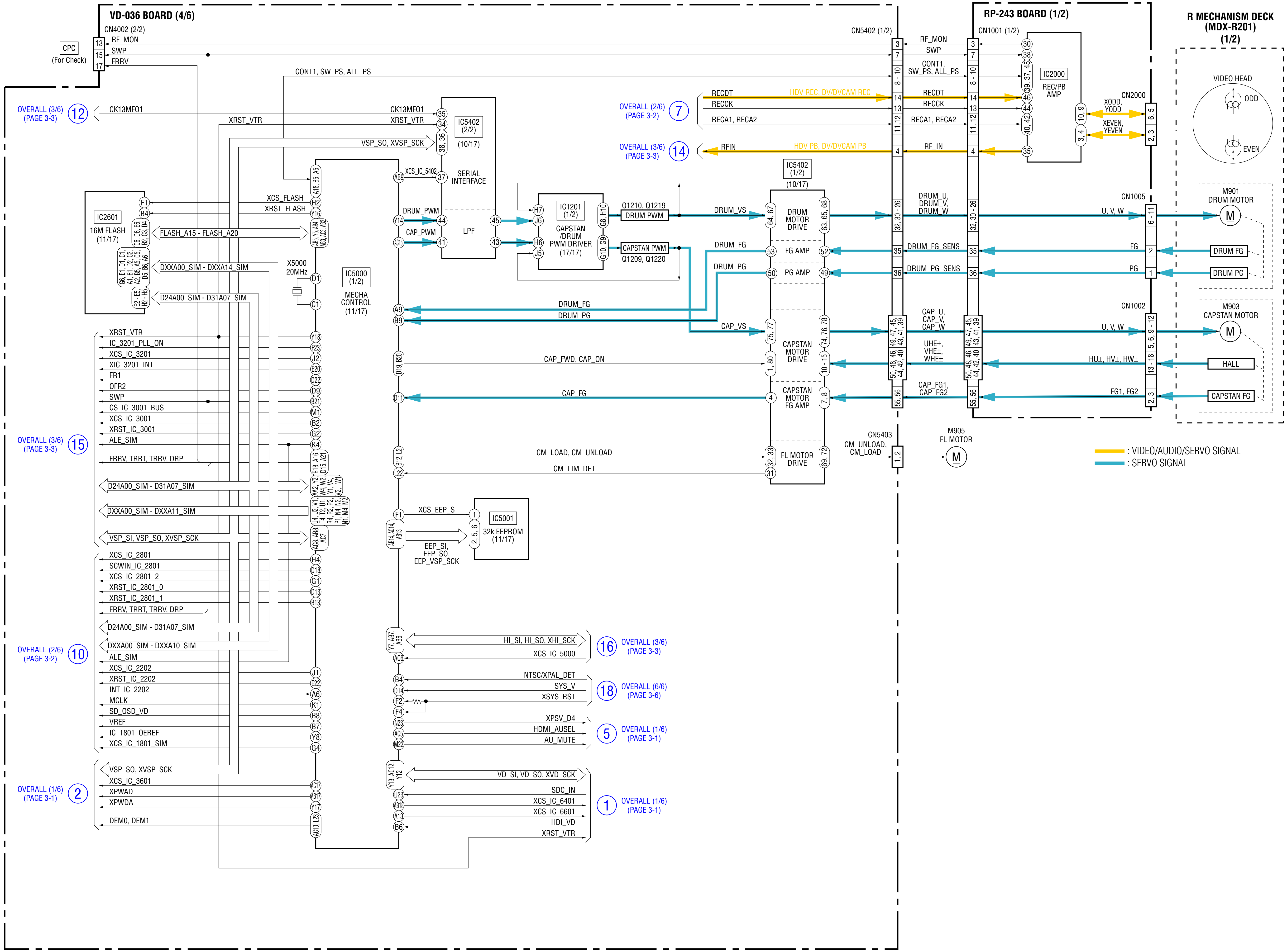


3-3. OVERALL BLOCK DIAGRAM (3/6)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.



3-4. OVERALL BLOCK DIAGRAM (4/6) ( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.

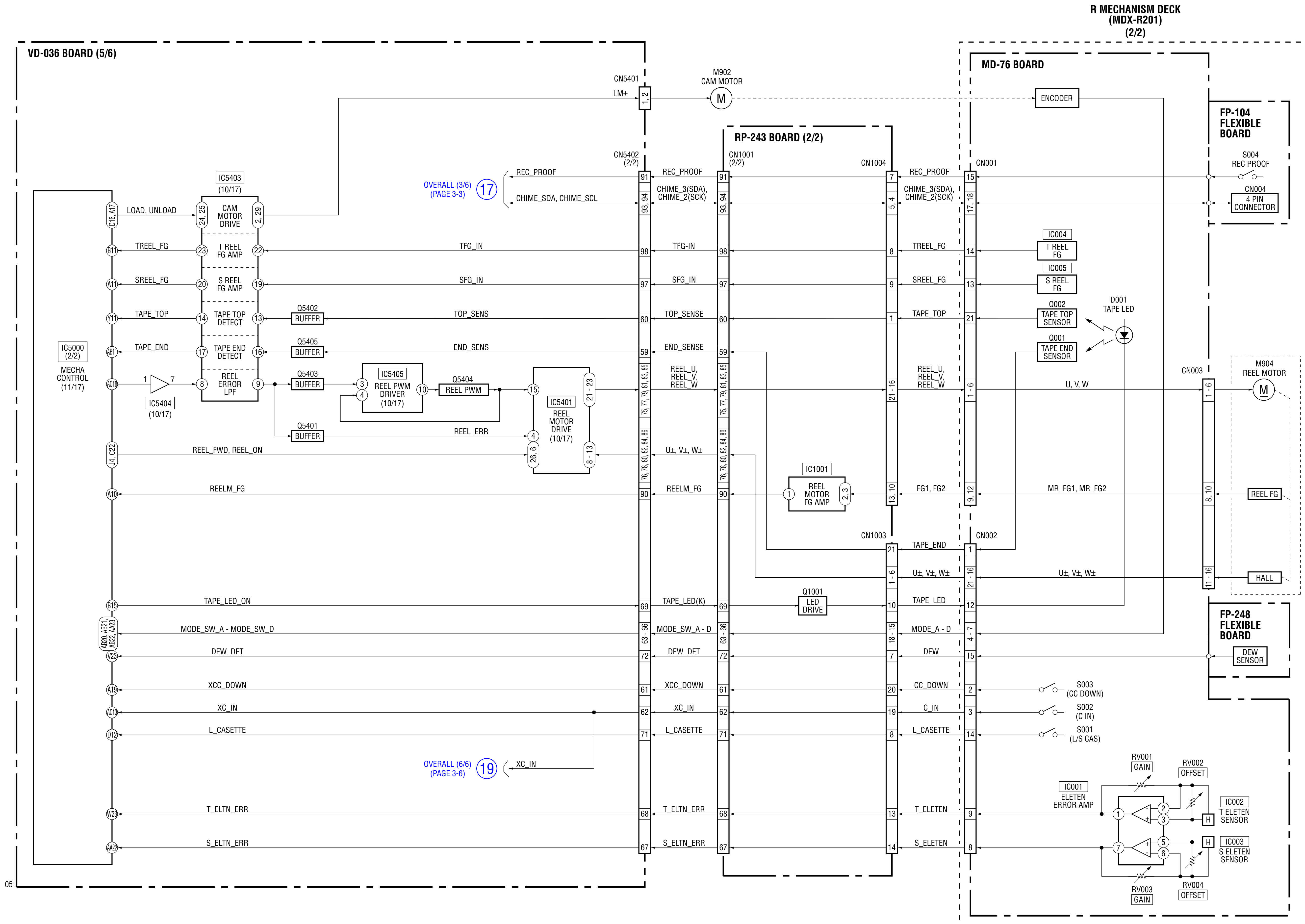


05

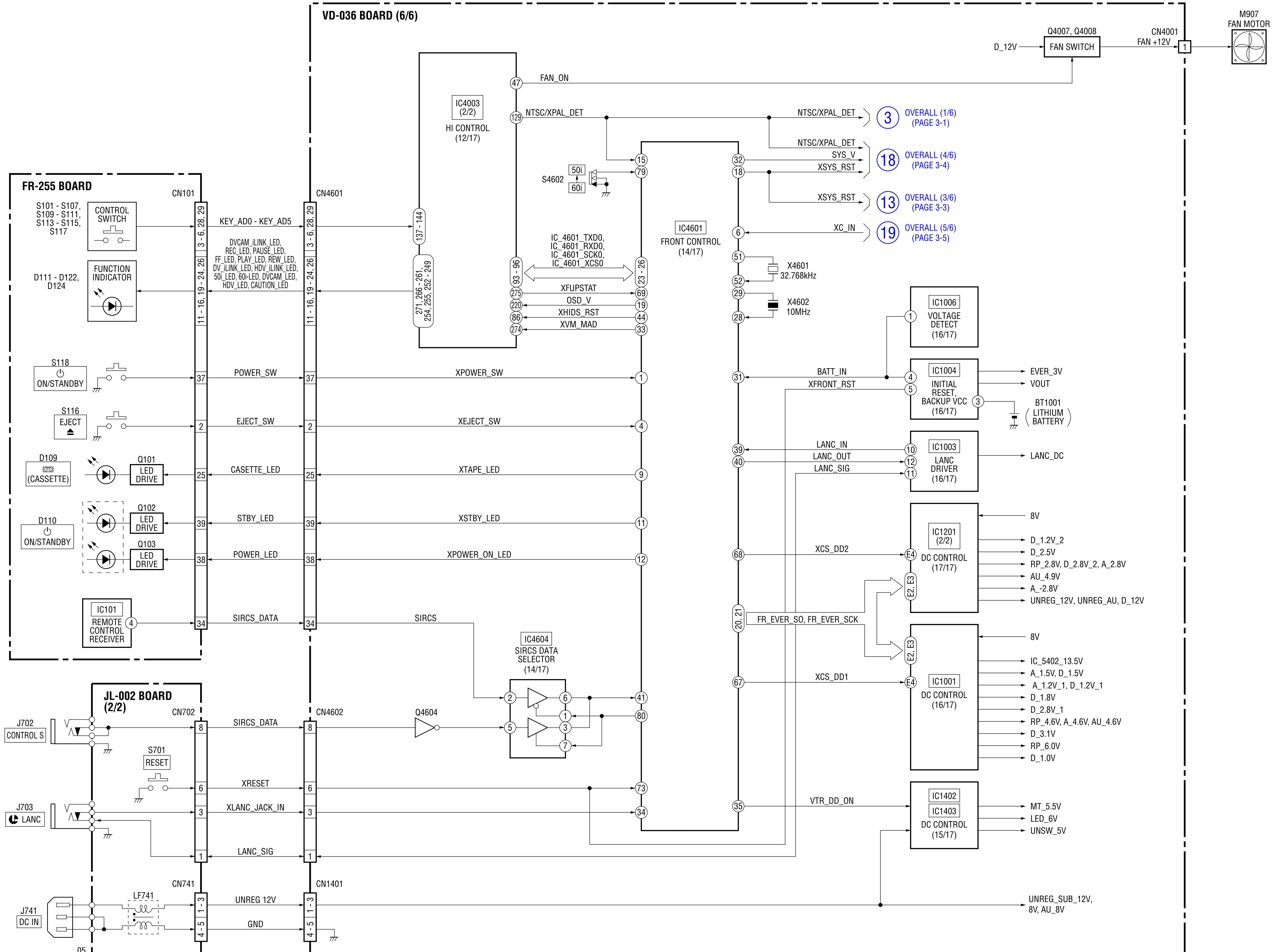
HVR-M15J/M15U/M15N/M15E/M15P/M15C

3-5. OVERALL BLOCK DIAGRAM (5/6)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.

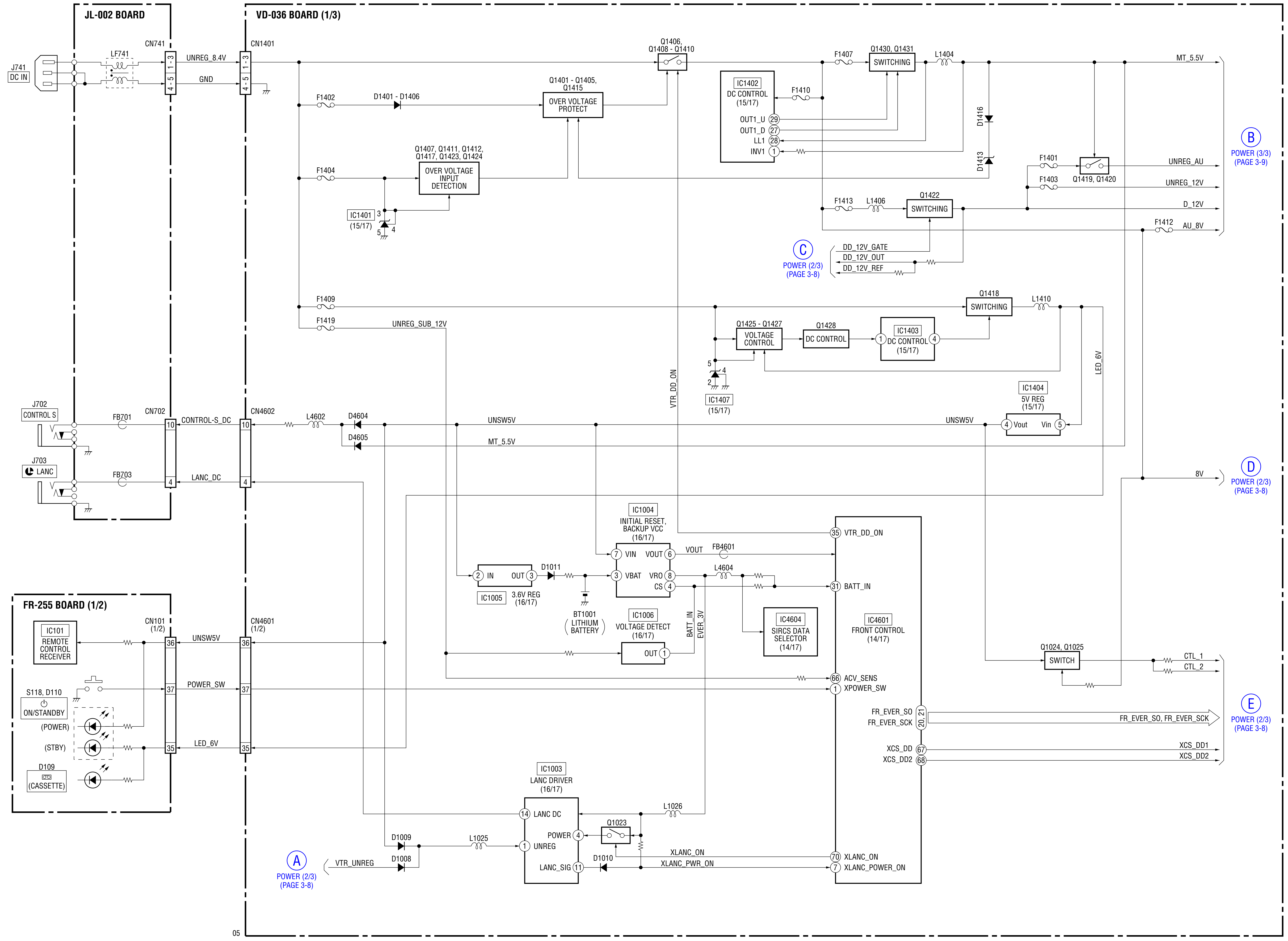


3-6. OVERALL BLOCK DIAGRAM (6/6) ( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.



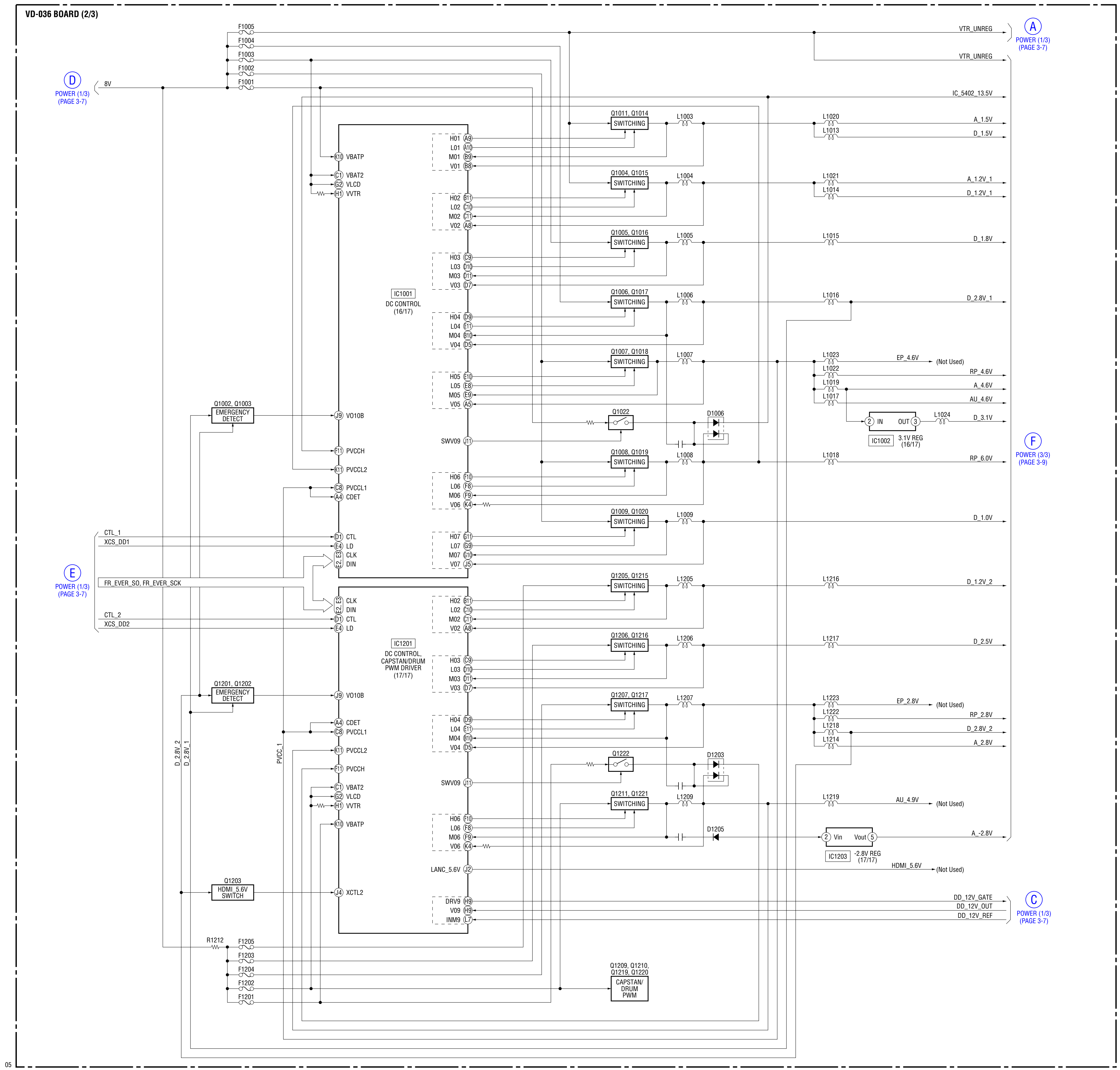
3-7. POWER BLOCK DIAGRAM (1/3)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.



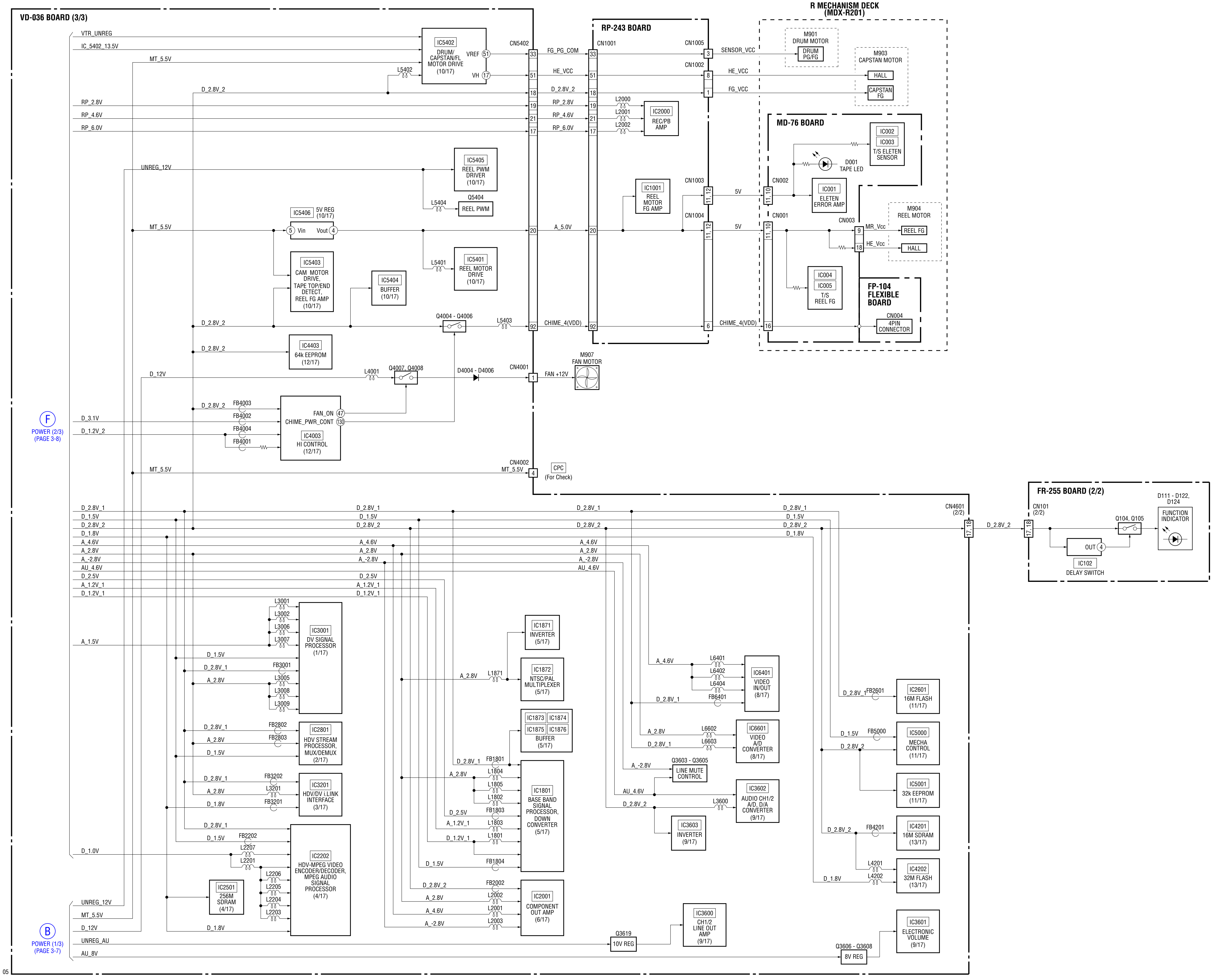
3-8. POWER BLOCK DIAGRAM (2/3)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.

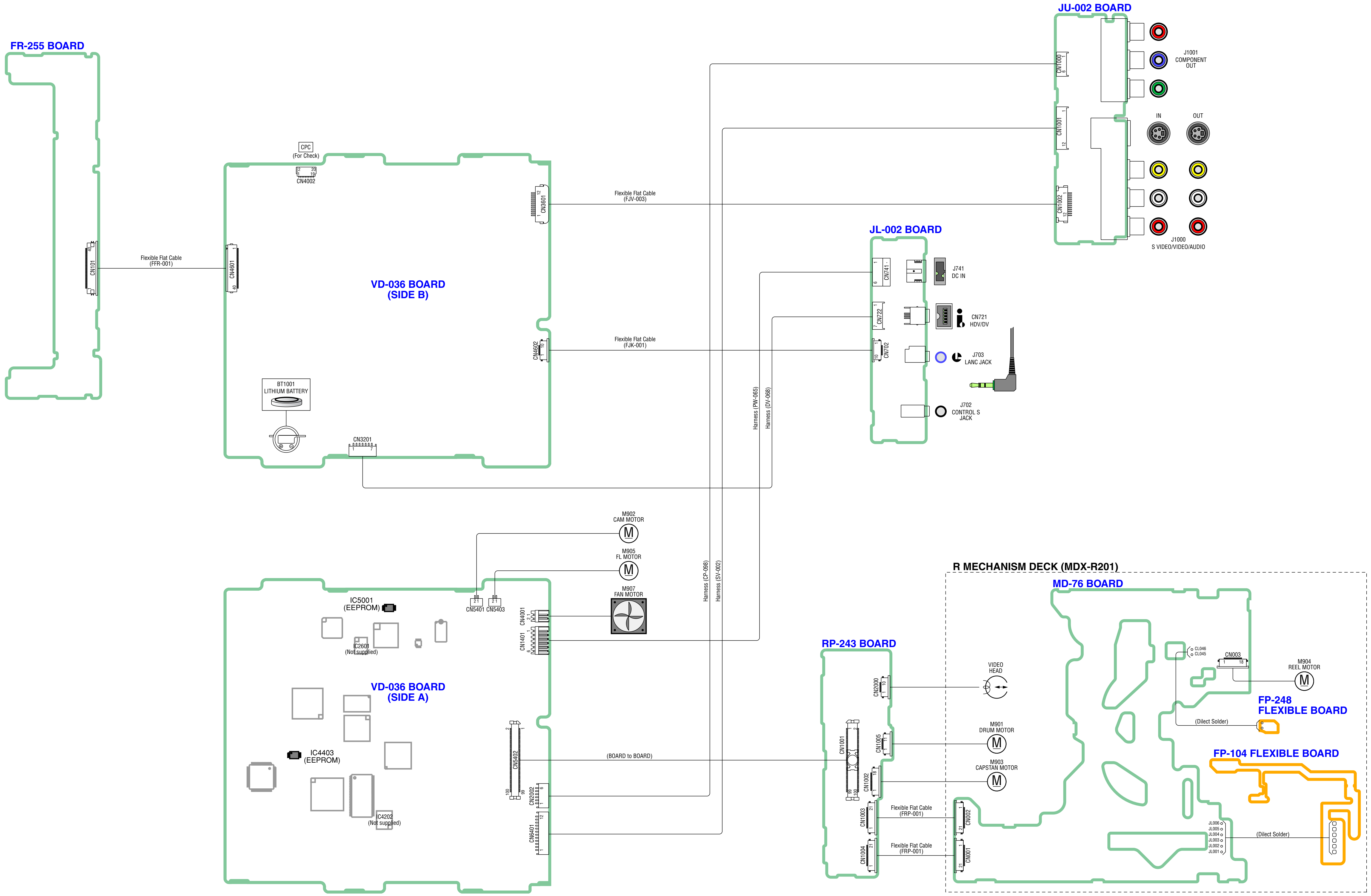


3-9. POWER BLOCK DIAGRAM (3/3)

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.



4-1. FRAME SCHEMATIC DIAGRAM



4-2. SCHEMATIC DIAGRAMS

Link

RP-243 BOARD (REC/PB AMP)	VD-036 BOARD (12/17) (HI CONTROL)
VD-036 BOARD (1/17) (DV SIGNAL PROCESS)	VD-036 BOARD (13/17) (SDRAM, FLASH)
VD-036 BOARD (2/17) (HDV STREAM PROCESS)	VD-036 BOARD (14/17) (FRONT CONTROL)
VD-036 BOARD (3/17) (HDV/DV i.LINK INTERFACE)	VD-036 BOARD (15/17) (DC IN, DC/DC CONVERTER 1)
VD-036 BOARD (4/17) (HDV-MPEG VIDEO ENCODE/DECODE)	VD-036 BOARD (16/17) (DC/DC CONVERTER 2)
VD-036 BOARD (5/17) (BASE BAND SIGNAL PROCESS)	VD-036 BOARD (17/17) (DC/DC CONVERTER 3)
VD-036 BOARD (6/17) (COMPONENT OUT)	MD-76 BOARD (TAPE SENSOR)
VD-036 BOARD (7/17) (Not Used)	FP-248 FLEXIBLE BOARD (DEW SENSOR)
VD-036 BOARD (8/17) (VIDEO IN/OUT)	FP-104 FLEXIBLE BOARD (CASSETTE DETECTION SWITCH)
VD-036 BOARD (9/17) (AUDIO IN/OUT)	FR-255 BOARD (USER CONTROL)
VD-036 BOARD (10/17) (SERVO)	JU-002 BOARD (VIDEO/AUDIO IN/OUT)
VD-036 BOARD (11/17) (MECHA CONTROL)	JL-002 BOARD (JACK)

- COMMON NOTE FOR SCHEMATIC DIAGRAMS

4-2. SCHEMATIC DIAGRAMS (ENGLISH)

THIS NOTE IS COMMON FOR SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

(For schematic diagrams)

- All capacitors are in μF unless otherwise noted. pF : μ μF. 50 V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10 W unless otherwise noted. kΩ=1000 Ω, MΩ=1000 kΩ.
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.

Example	C541	L452
	22U	10UH
	TA A	2520

TA: Kinds of capacitor; A: Case size; 2520: External dimensions (mm)

- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used. In such cases, the unused circuits may be indicated.
- Parts with ★ differ according to the model/destination. Refer to the mount table for each function.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name
  XEDIT → $\overline{\text{EDIT}}$ PB/XREC → PB/$\overline{\text{REC}}$
- (symbol) : non flammable resistor
- (symbol) : fusible resistor
- (symbol) : panel designation
- (symbol) : B+ Line
- (symbol) : B– Line
- (symbol) : IN/OUT direction of (+,–) B LINE.
- (symbol) : adjustment for repair.
- (symbol) : not use circuit

(Measuring conditions voltage)

- Voltages are measured between the measurement points and ground when color bar signal input. They are reference values and reference waveforms. (VOM of DC 10 MΩ input impedance is used)
- Voltage values change depending upon input impedance of VOM used.)

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifie.

(JAPANESE)

回路図共通ノート
（他に必要なノートは各ブロックに記載してあります）

【回路図ノート】
・ケミコン，タンタルを除くコンデンサで，耐圧50V以下のものはその耐圧を省略。単位はすべてμF（pはpF）。
・チップ抵抗で指示のないものは，1／10W以下。
kΩ＝1000Ω，MΩ＝1000kΩ
・チップ部品交換時の注意
取り外した部品は再使用せず，未使用の部品をご使用ください。
タンタルコンデンサのマイナス側は熱に弱いため注意してください。
・チップ部品には下記のように表示したものがあります。

例	C 541		L 452
	22U		10UH
	TA	A	2520
	↑	↑	↑
	種類	ケースサイズ	外形寸法（mm）

・抵抗，コンデンサ，ICなど定数にXXがあるものは，使用していない事を示しています。このため，使用していない回路が記載されている事があります。
・★印のある部品は，機種などにより異なりますので機能別マウント一覧表を参照してください。
・可変抵抗と半固定抵抗で，B特性の表示を省略。
・信号名表記について，下記のような場合があります。
XEDIT → $\overline{\text{EDIT}}$　　PB/XREC → PB/$\overline{\text{REC}}$
・[不燃性抵抗記号]は不燃性抵抗。
・[ヒューズ抵抗記号]はヒューズ抵抗。
・[枠]はパネル表示名称。
・[赤実線]はB＋ライン。
・[赤破線]はB－ライン。
・[矢印]はBライン（＋，－）の入出力方向を示す。
・[赤枠]は調整名称。
・[灰色線]は未使用回路。

【電圧測定条件ノート】
・電圧値はカラーバーゼネレータよりカラーバー信号を入力したときの対アース間の参考値。
（デジタルマルチメータ；入力インピーダンス　DC10MΩ使用）
・使用テスタの入力インピーダンスにより電圧値が多少異なります。

⚠印の部品，または⚠印付きの点線で囲まれた部品は，安全性を維持するために重要な部品です。
従って交換時は，必ず指定の部品を使用して下さい。

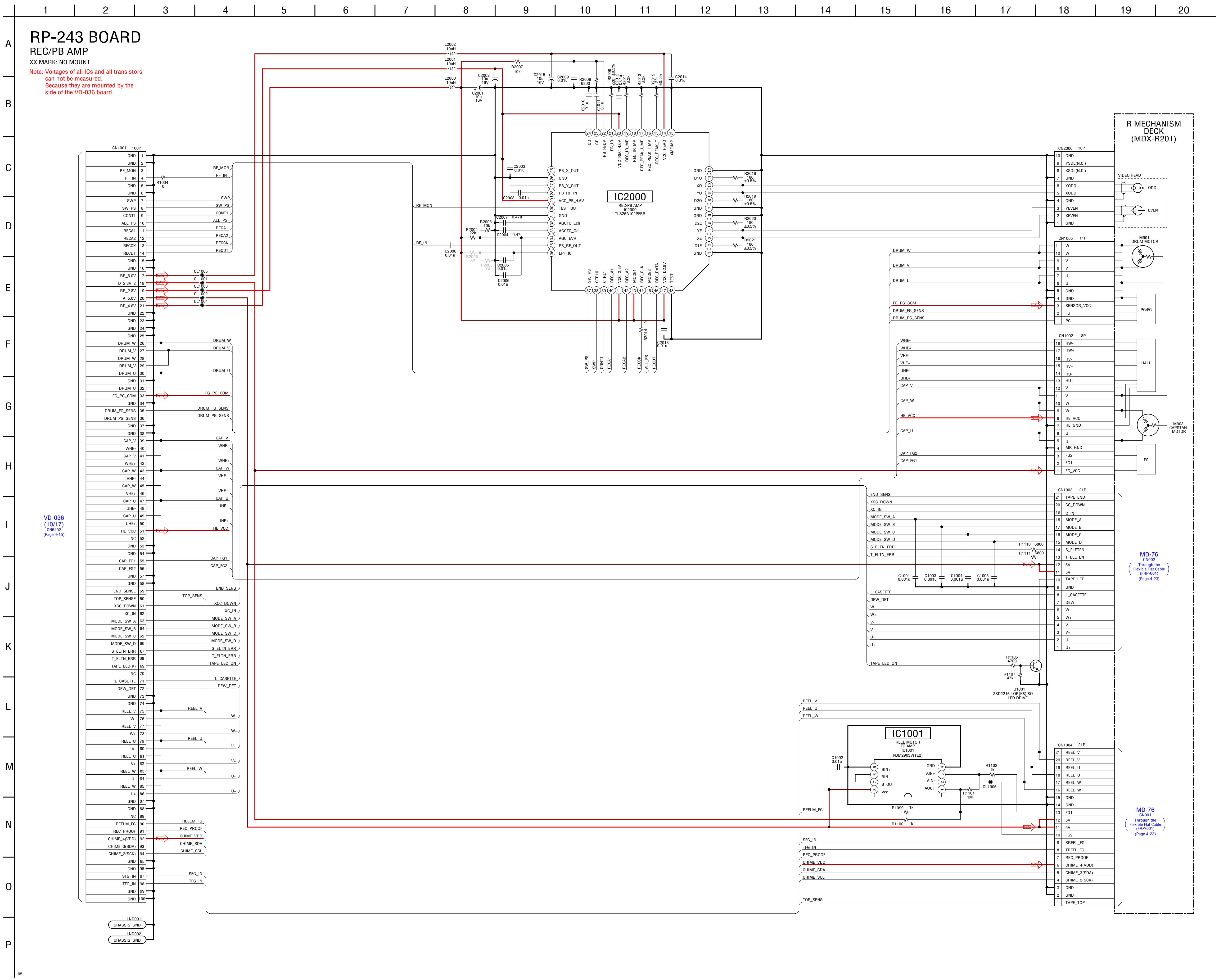
お願い
図面番号で部品を指定するときは基板名又はブロックを併せて指定して下さい。

RP-243 BOARD

REC/PB AMP

XX MARK: NO MOUNT

Note: Voltages of all ICs and all transistors can not be measured. Because they are mounted by the side of the VD-036 board.

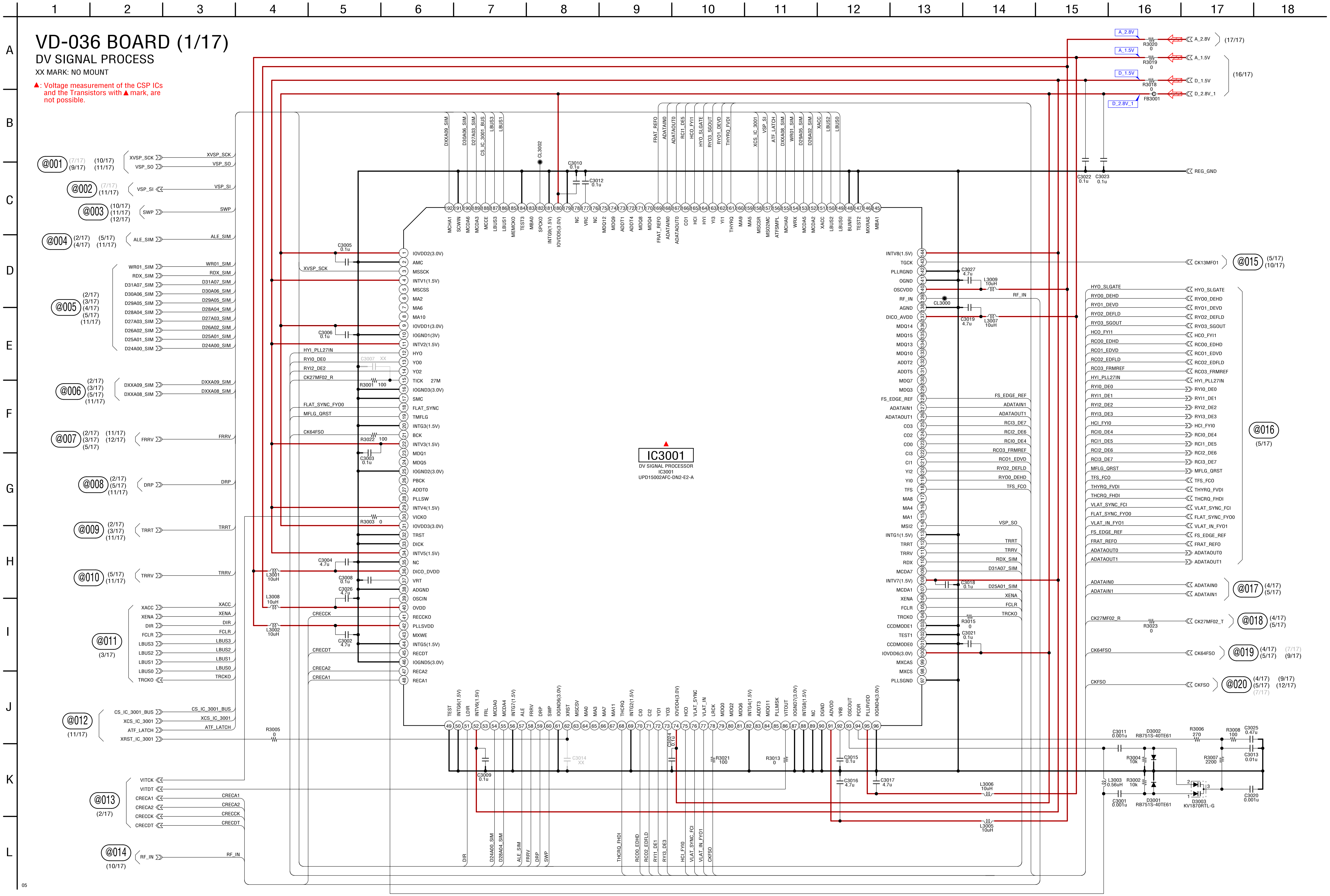


VD-036 BOARD (1/17)

DV SIGNAL PROCESS

XX MARK: NO MOUNT

▲: Voltage measurement of the CSP ICs and the Transistors with ▲ mark, are not possible.

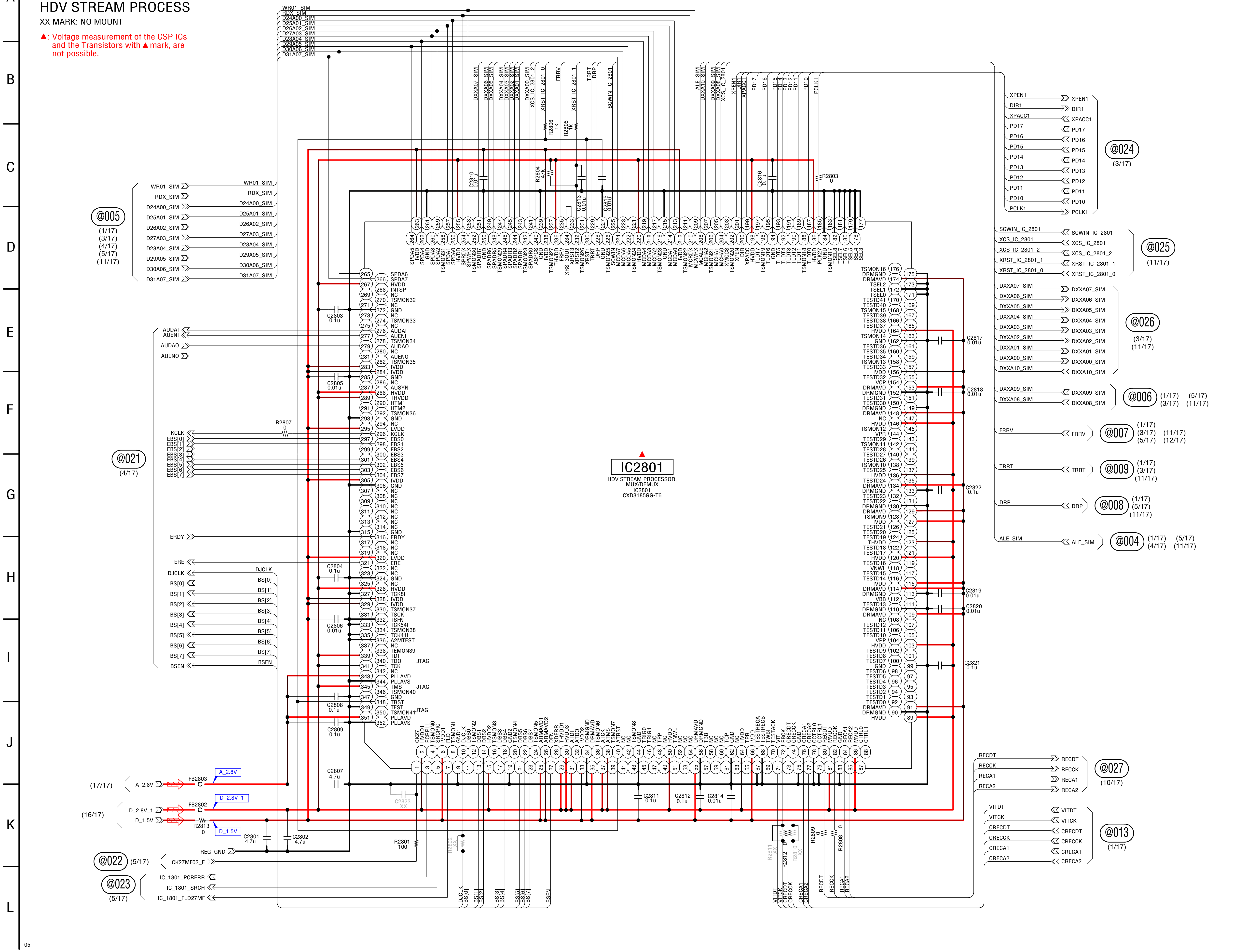


VD-036 BOARD (2/17)

HDV STREAM PROCESS

XX MARK: NO MOUNT

▲: Voltage measurement of the CSP ICs and the Transistors with ▲ mark, are not possible.

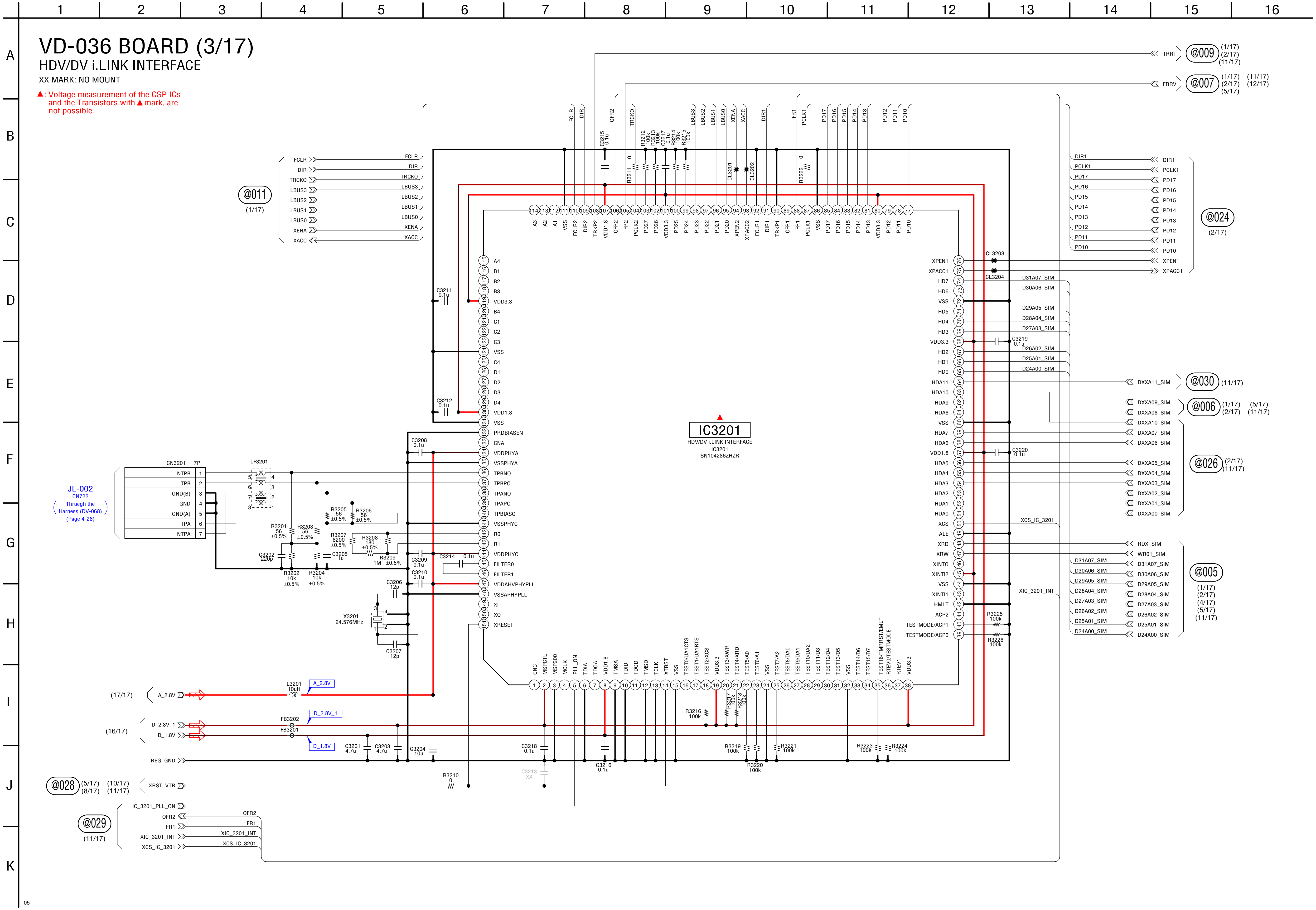


VD-036 BOARD (3/17)

HDV/DV i.LINK INTERFACE

XX MARK: NO MOUNT

▲: Voltage measurement of the CSP ICs and the Transistors with ▲ mark, are not possible.

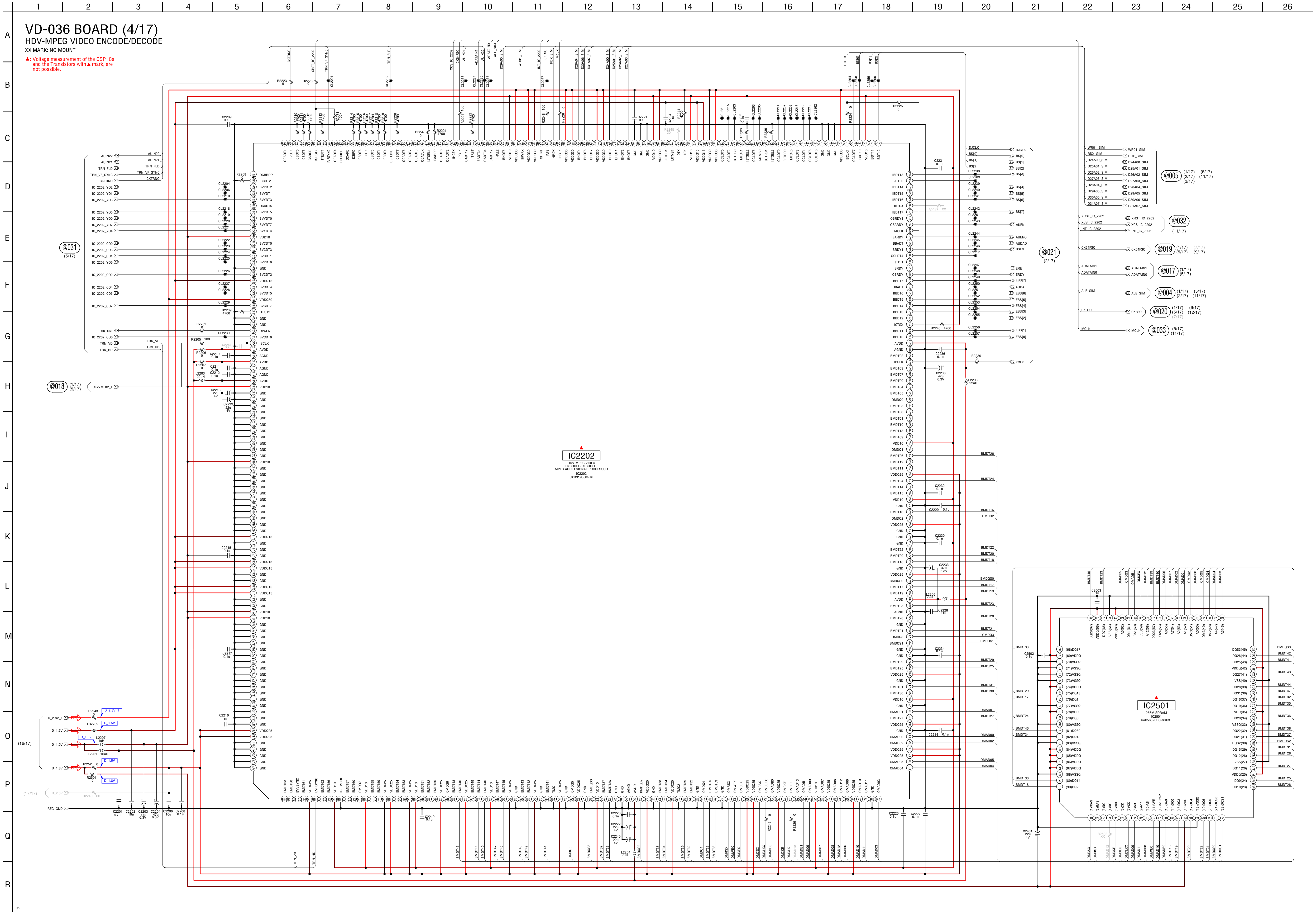


VD-036 BOARD (4/17)

HDV-MPEG VIDEO ENCODE/DECODE

XX MARK: NO MOUNT

▲: Voltage measurement of the CSP ICs and the Transistors with ▲ mark, are not possible.

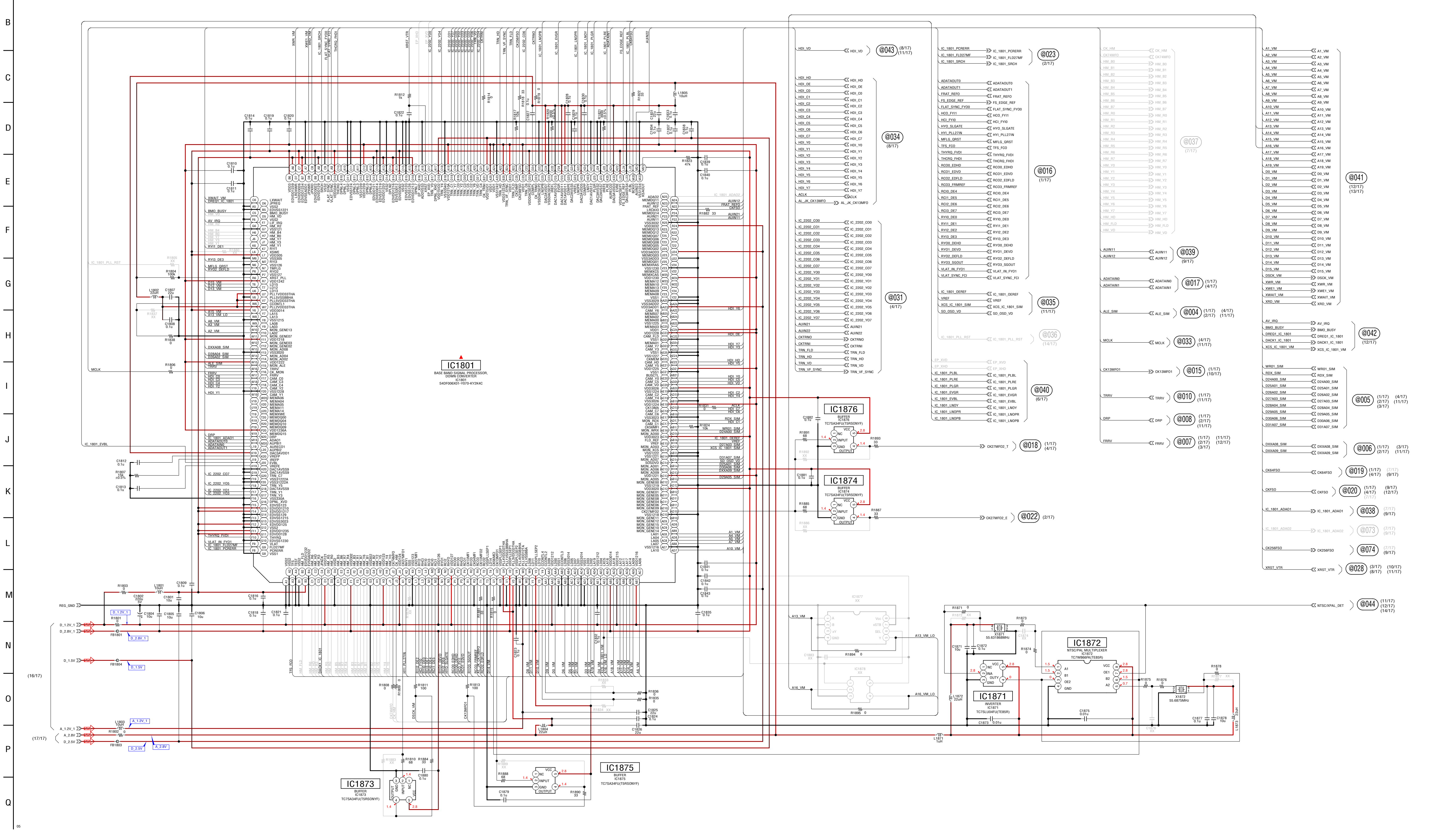


VD-036 BOARD (5/17)

BASE BAND SIGNAL PROCESS

XX MARK: NO MOUNT
NO MARK: REC/PB MODE

▲: Voltage measurement of the CSP ICs and the Transistors with ▲mark, are not possible.

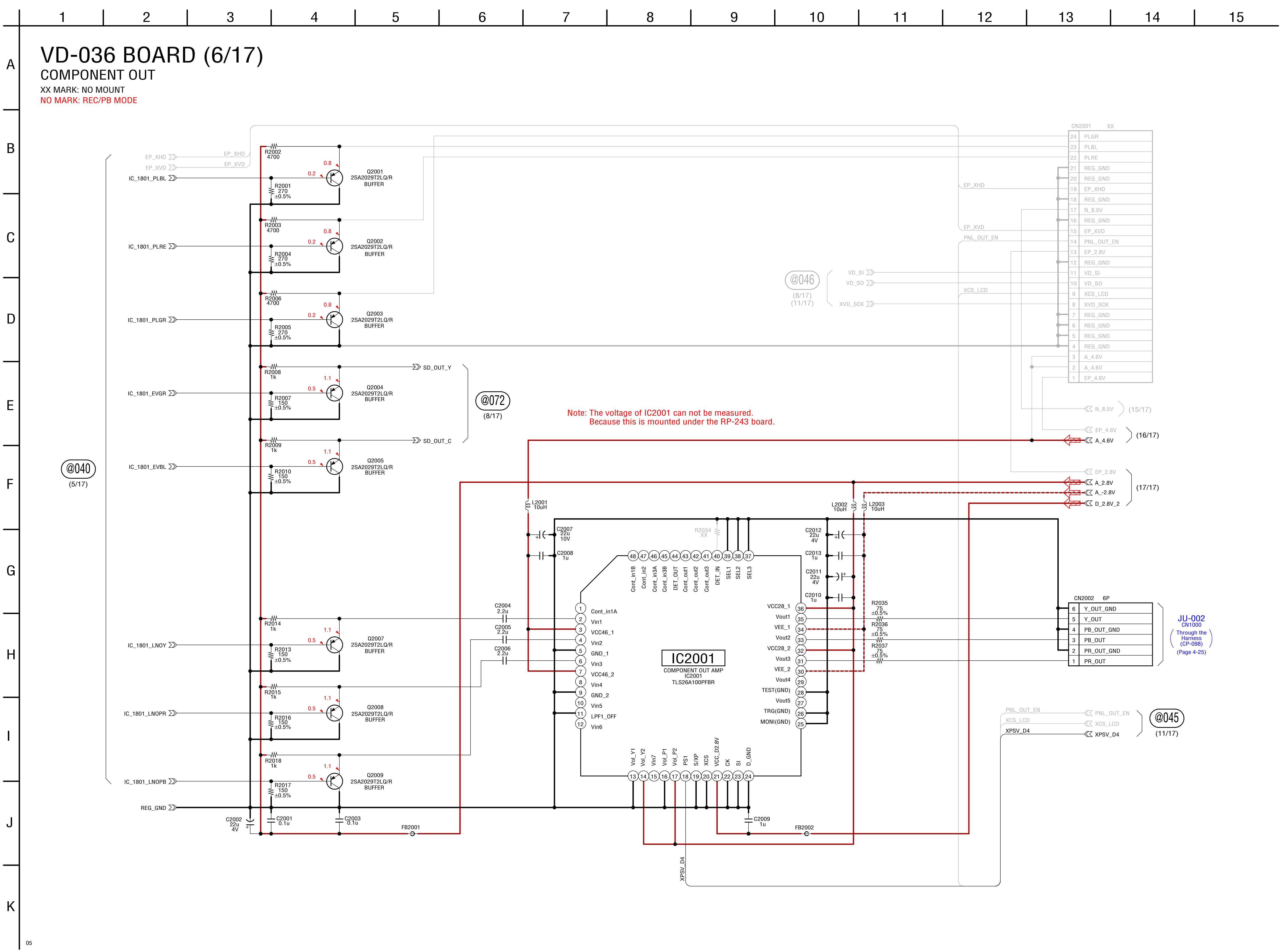


VD-036 BOARD (6/17)

COMPONENT OUT

XX MARK: NO MOUNT

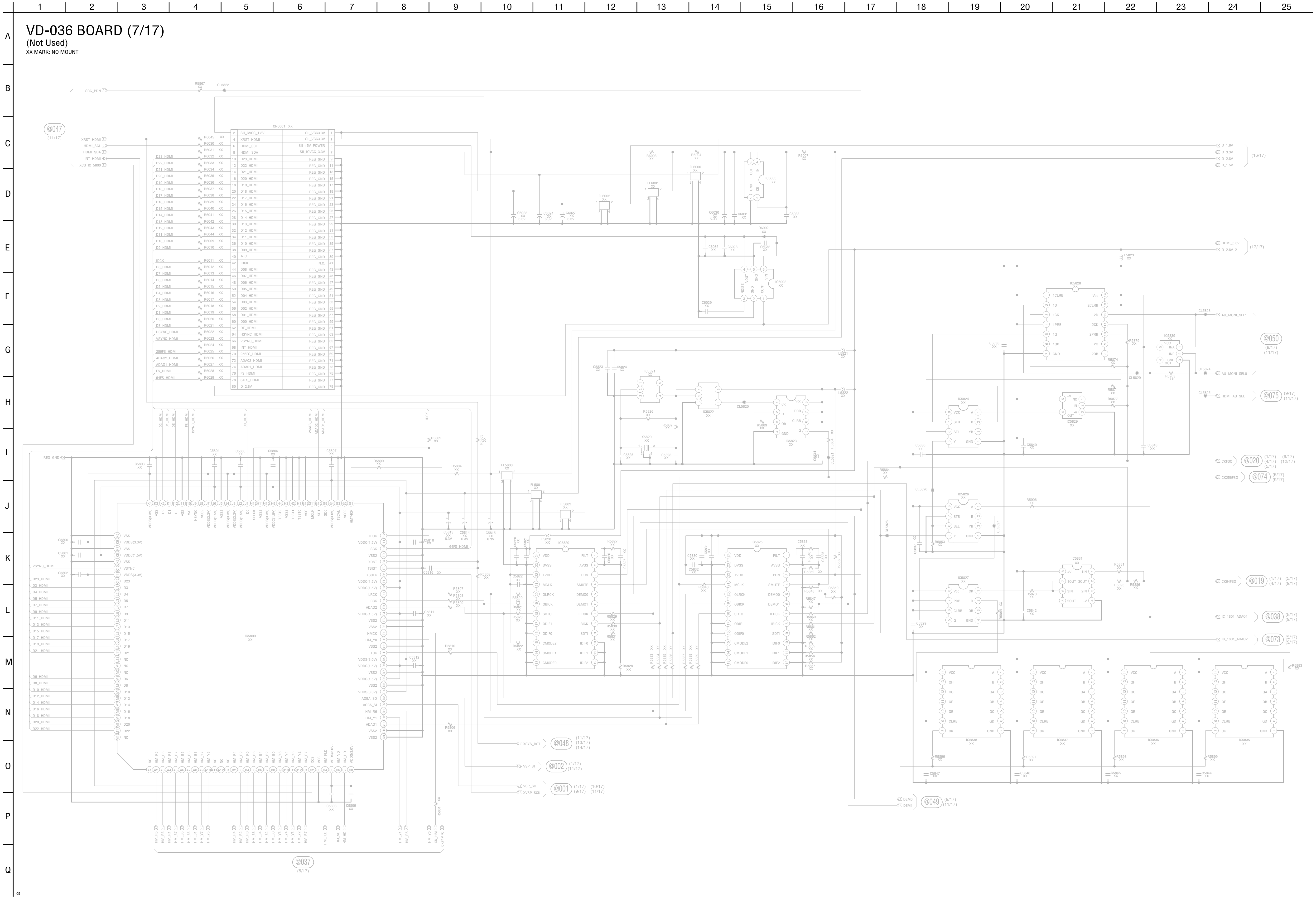
NO MARK: REC/PB MODE



VD-036 BOARD (7/17)

(Not Used)

XX MARK: NO MOUNT



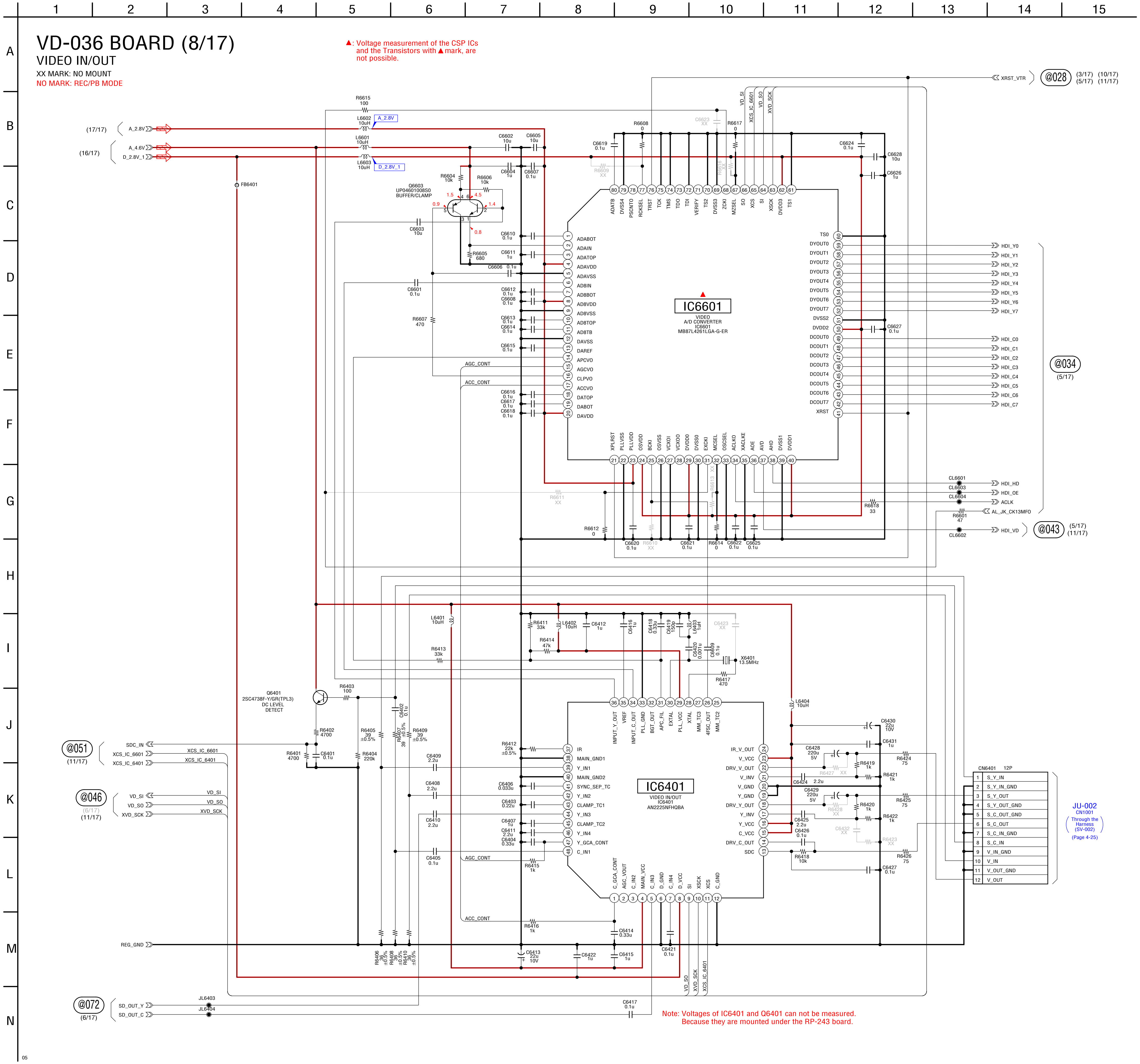
VD-036 BOARD (8/17)

VIDEO IN/OUT

XX MARK: NO MOUNT

NO MARK: REC/PB MODE

▲: Voltage measurement of the CSP ICs and the Transistors with ▲ mark, are not possible.

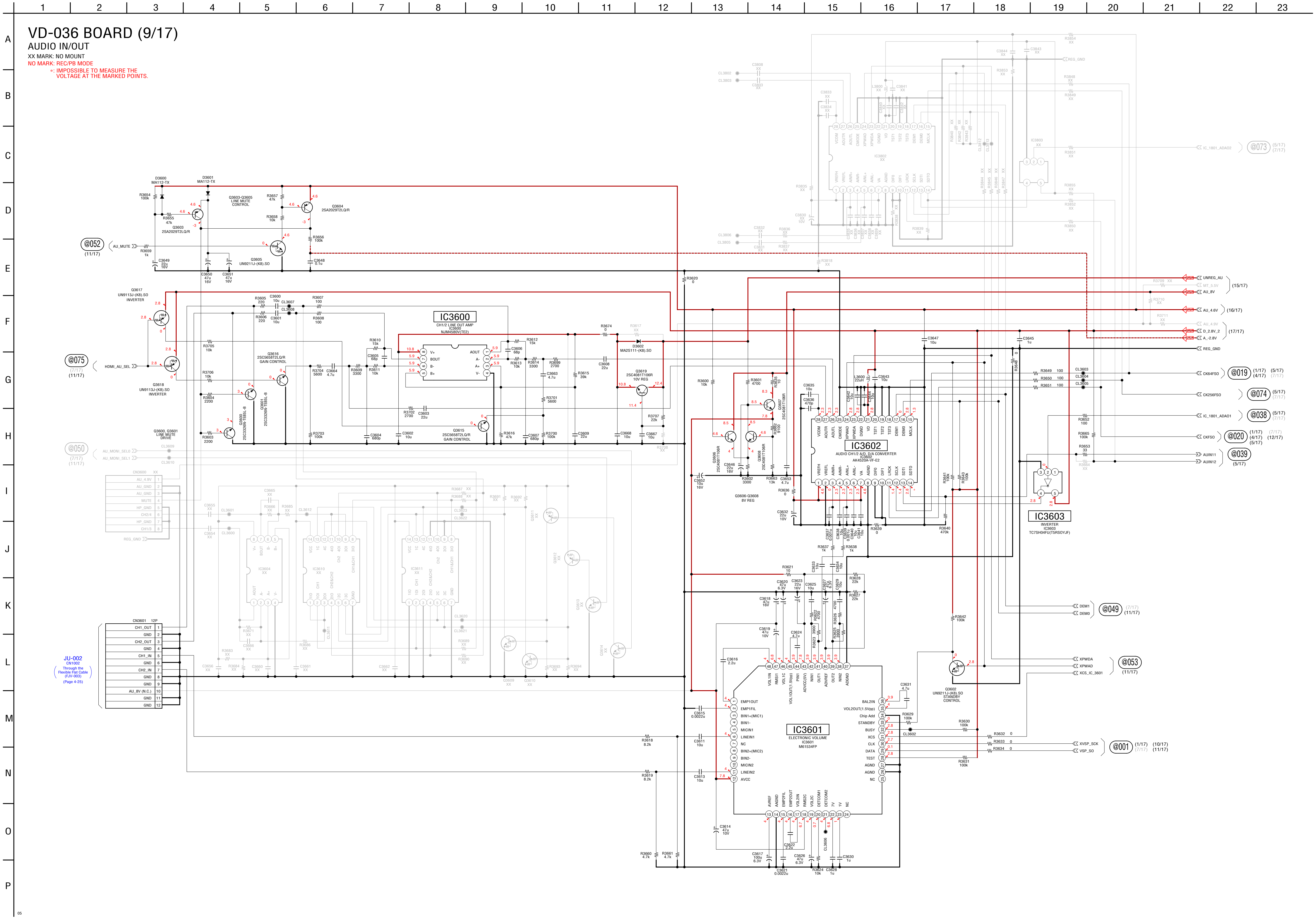


Note: Voltages of IC6401 and Q6401 can not be measured. Because they are mounted under the RP-243 board.

VD-036 BOARD (9/17)

AUDIO IN/OUT

XX MARK: NO MOUNT
NO MARK: REC/PB MODE
*: IMPOSSIBLE TO MEASURE THE VOLTAGE AT THE MARKED POINTS.

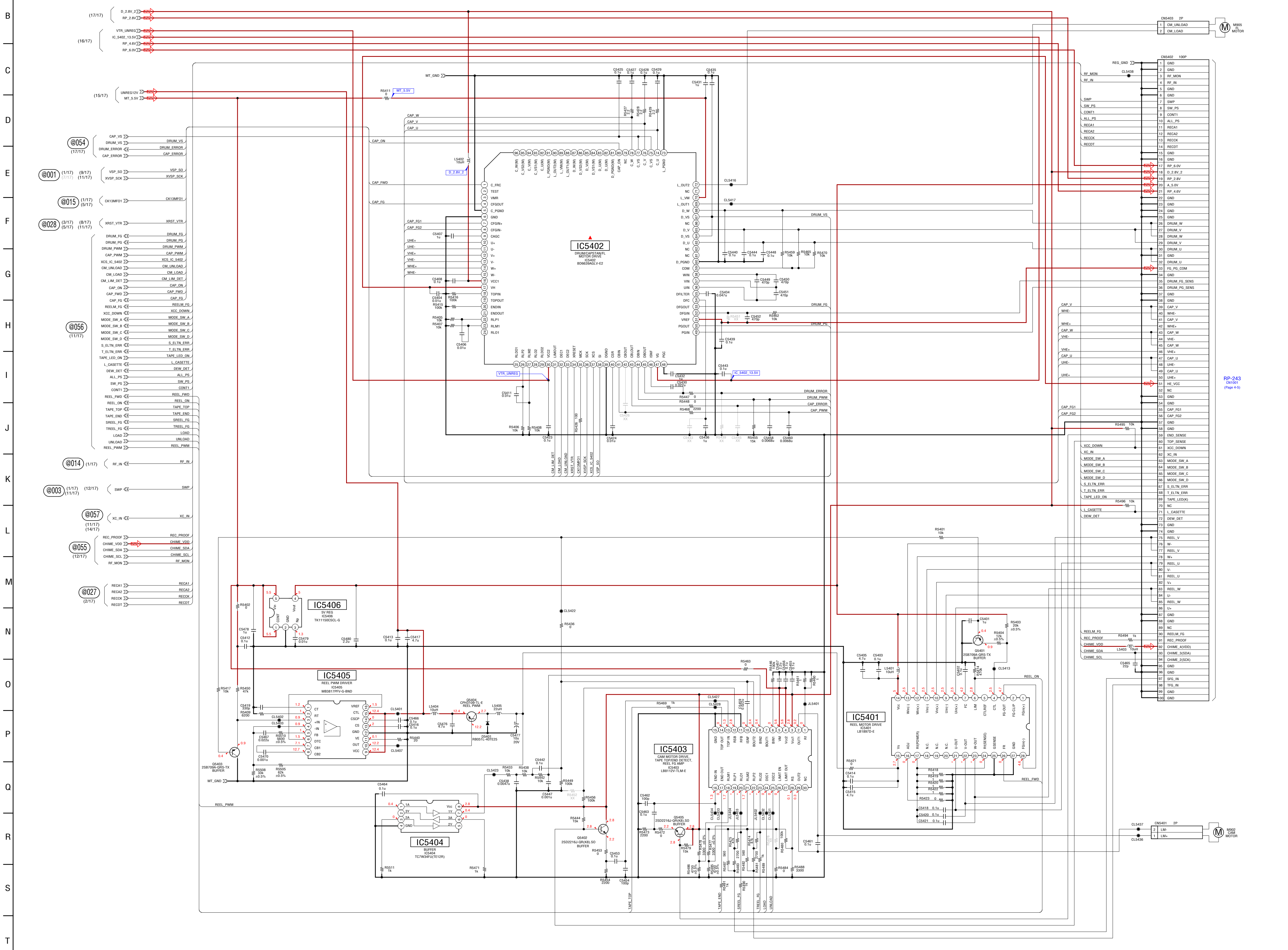


VD-036 BOARD (10/17)

SERVO

XX MARK: NO MOUNT
NO MARK: REC/PB MODE
*: IMPOSSIBLE TO MEASURE THE VOLTAGE AT THE MARKED POINTS.

▲: Voltage measurement of the CSP ICs and the Transistors with ▲ mark, are not possible.



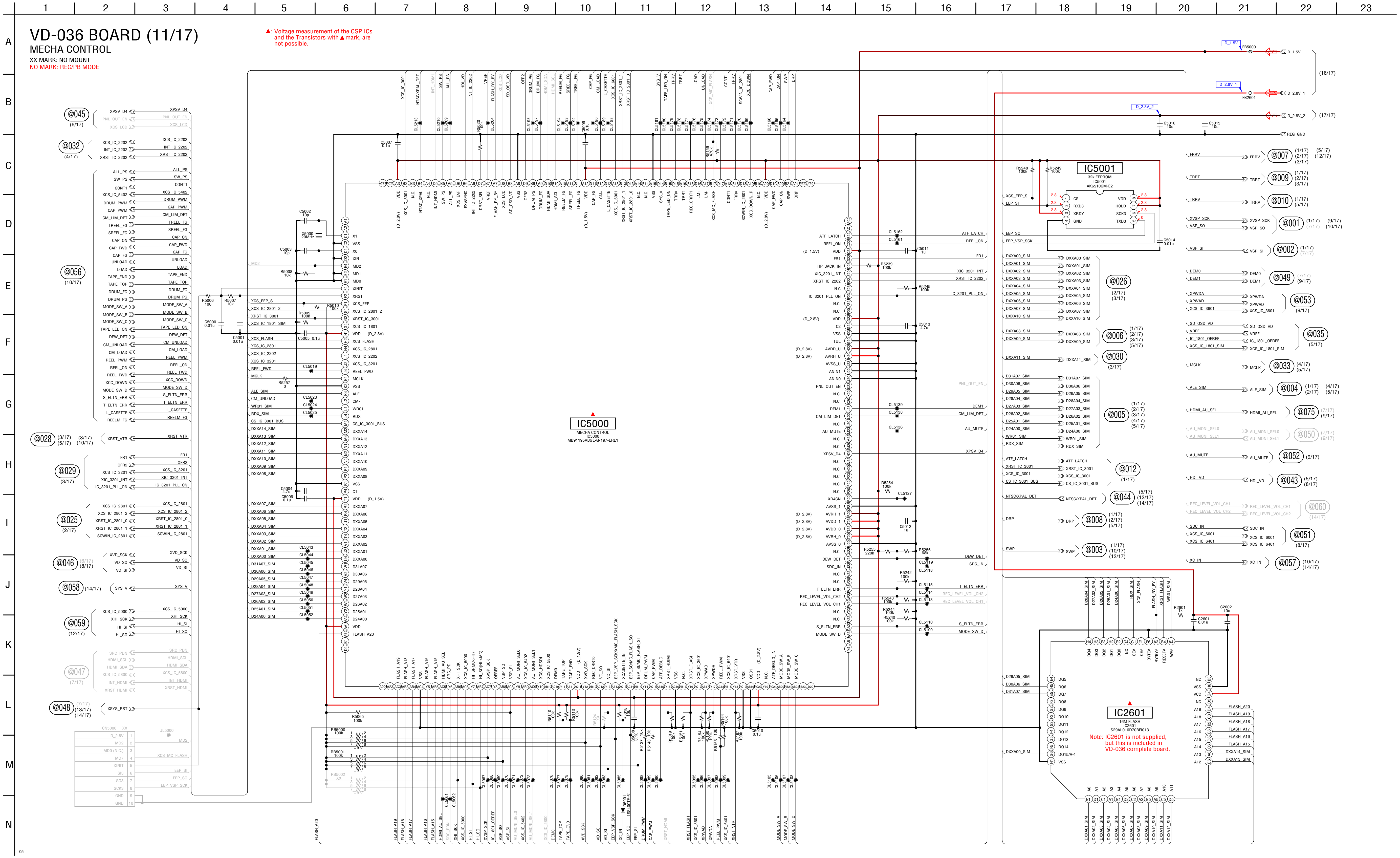
VD-036 BOARD (11/17)

MECHA CONTROL

XX MARK: NO MOUNT

NO MARK: REC/PB MODE

▲: Voltage measurement of the CSP ICs and the Transistors with ▲ mark, are not possible.



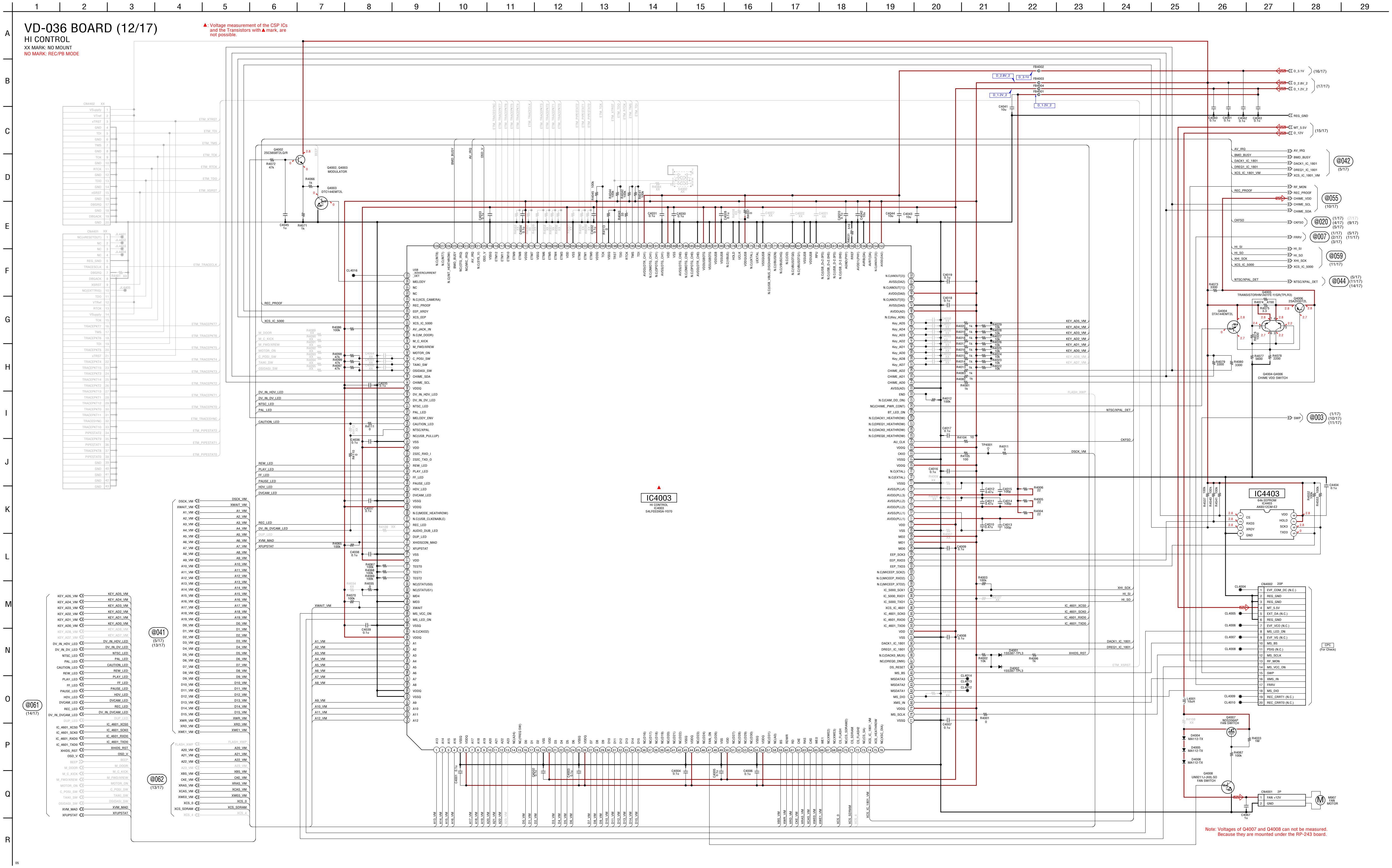
VD-036 BOARD (12/17)

HI CONTROL

XX MARK: NO MOUNT

NO MARK: REC/PB MODE

▲: Voltage measurement of the CSP ICs and the Transistors with ▲ mark, are not possible.



Note: Voltages of Q4007 and Q4008 can not be measured. Because they are mounted under the RP-243 board.

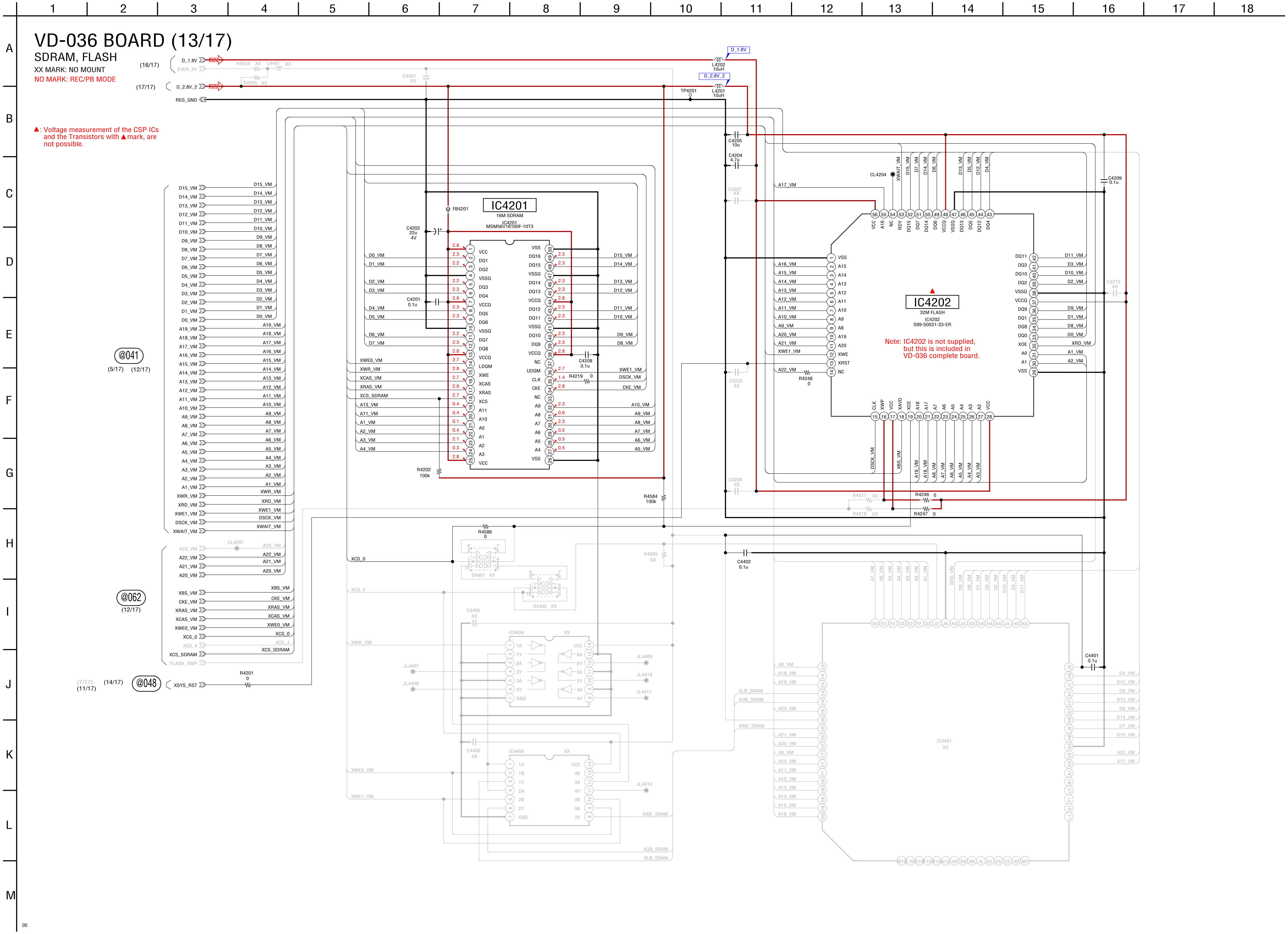
VD-036 BOARD (13/17)

SDRAM, FLASH

XX MARK: NO MOUNT

NO MARK: REC/PB MODE

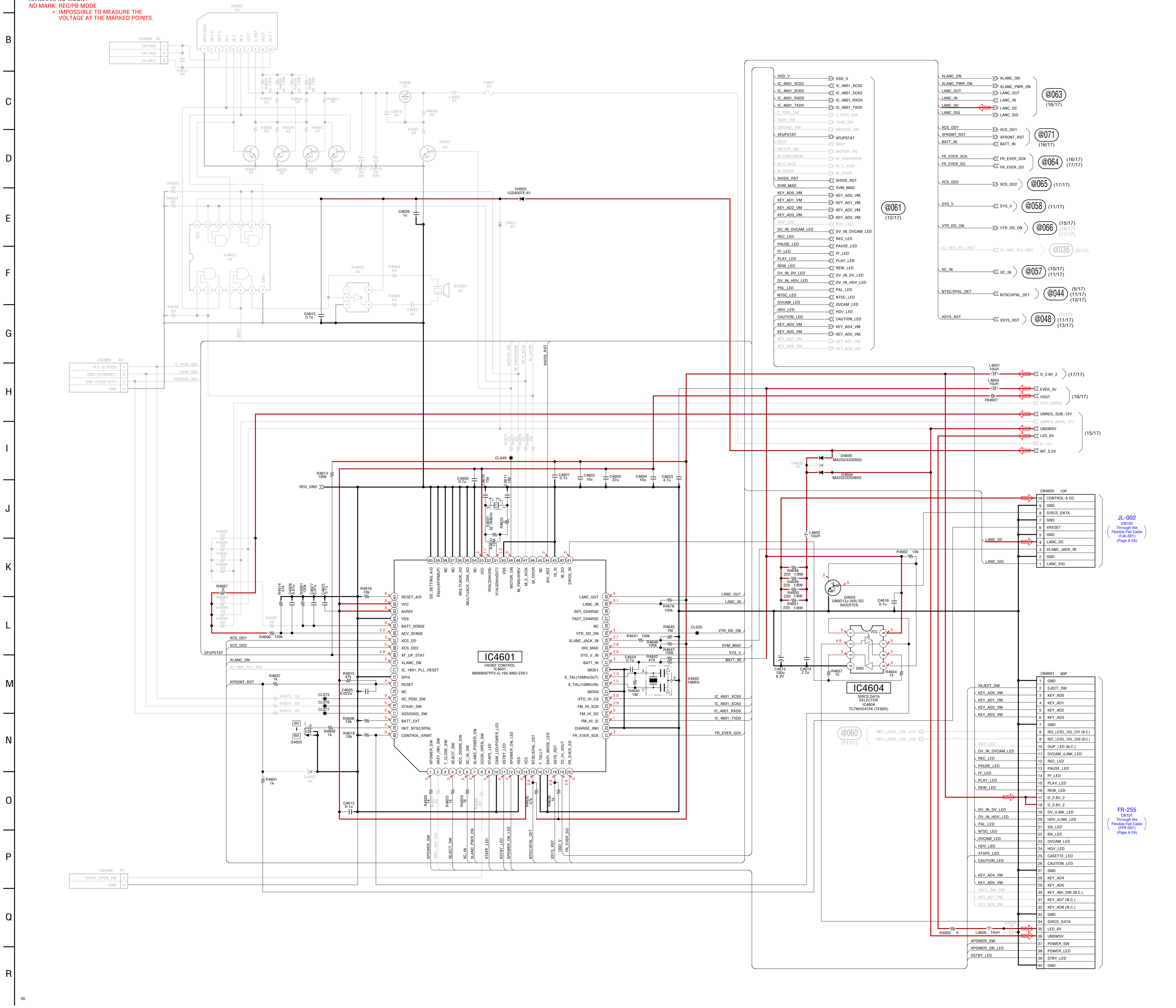
▲: Voltage measurement of the CSP ICs and the Transistors with ▲ mark, are not possible.



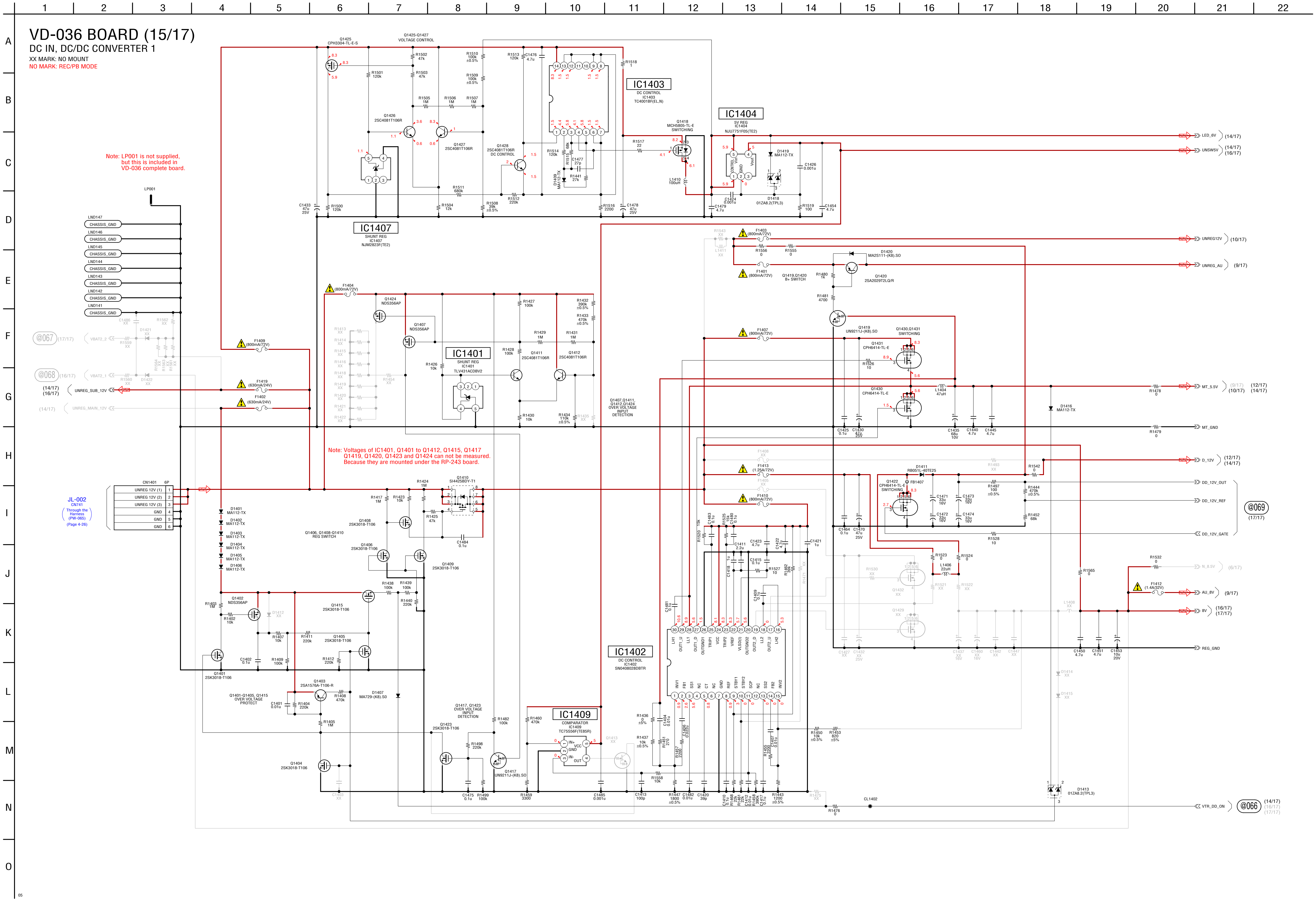
VD-036 BOARD (14/17)

FRONT CONTROL

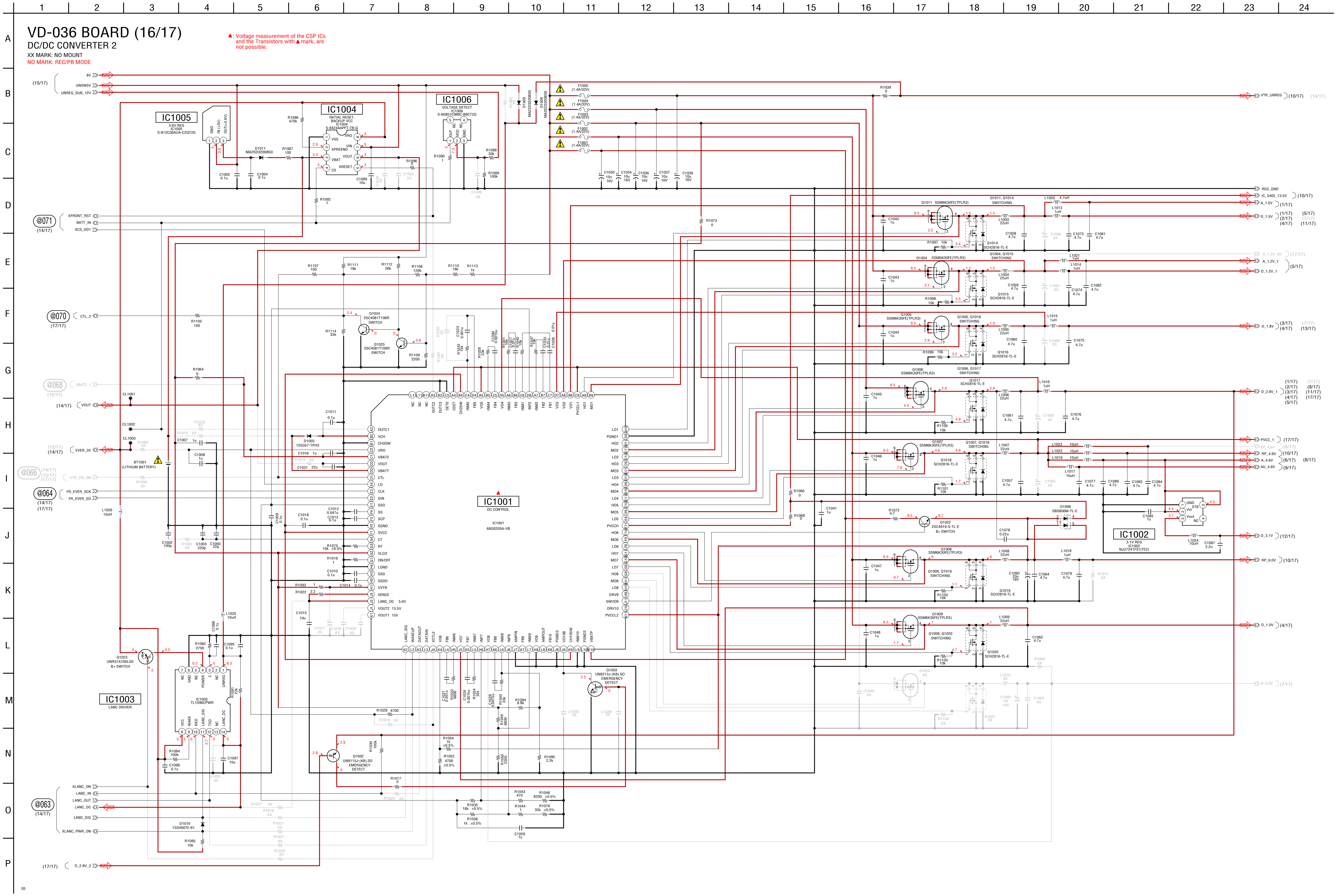
XX MARK: NO MOUNT
NO MARK: REC/PB MODE
*: IMPOSSIBLE TO MEASURE THE VOLTAGE AT THE MARKED POINTS.



• Refer to page 4-3 (English), 4-4 (Japanese) for mark ⚠.



• Refer to page 4-3 (English), 4-4 (Japanese) for mark ⚠.



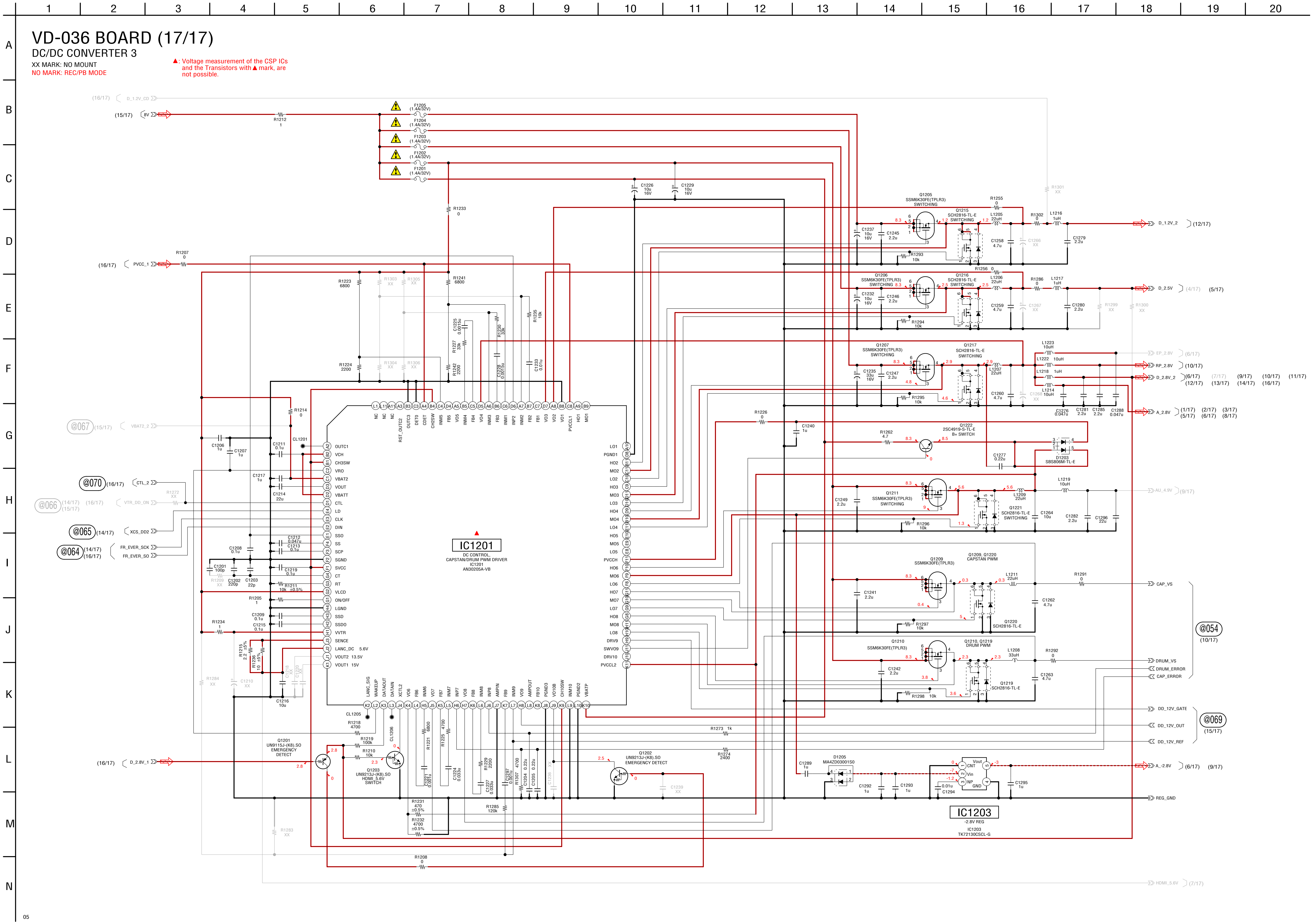
• Refer to page 4-3 (English), 4-4 (Japanese) for mark ⚠.

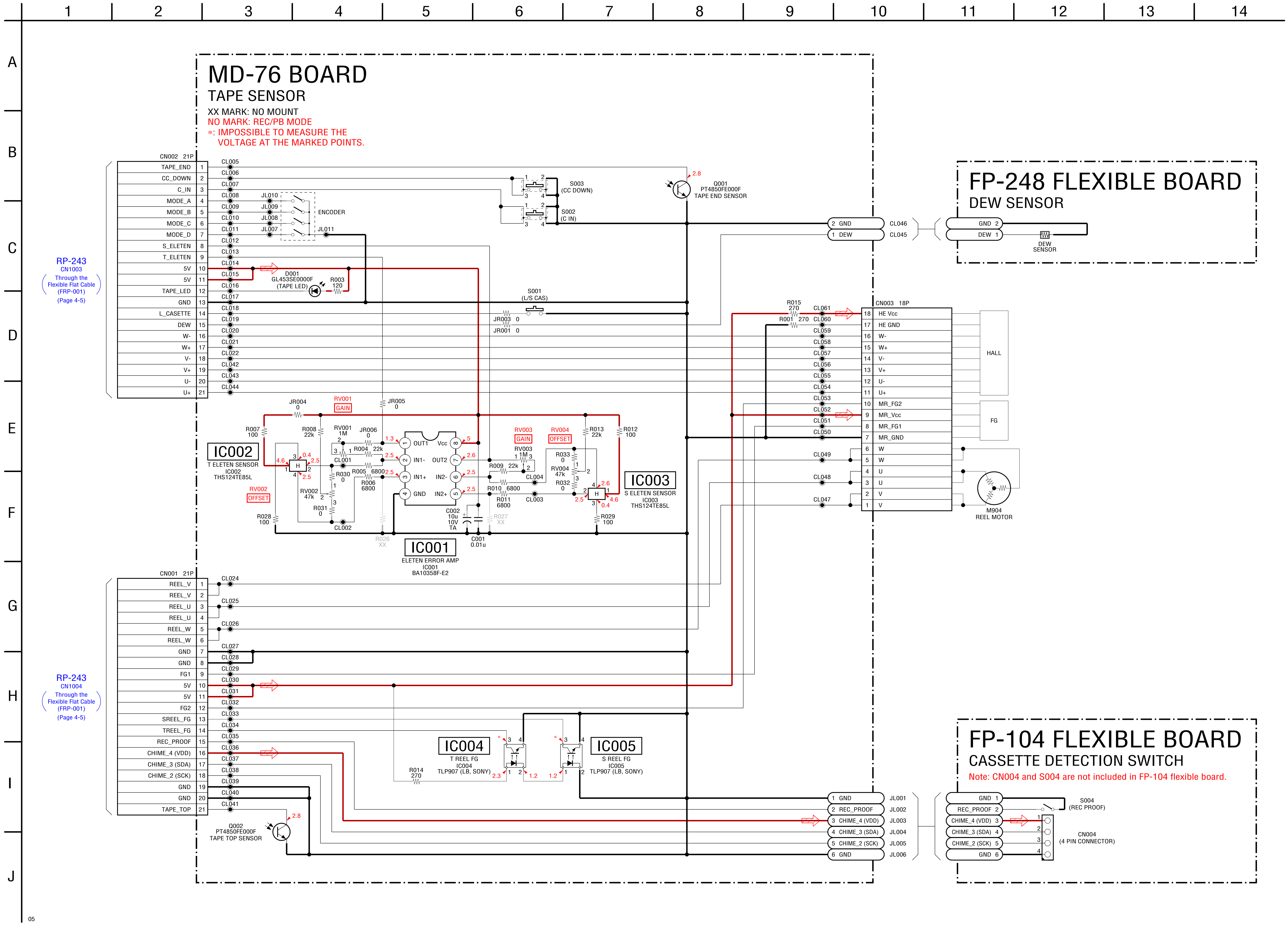
VD-036 BOARD (17/17)

DC/DC CONVERTER 3

XX MARK: NO MOUNT
NO MARK: REC/PB MODE

▲: Voltage measurement of the CSP ICs and the Transistors with ▲ mark, are not possible.



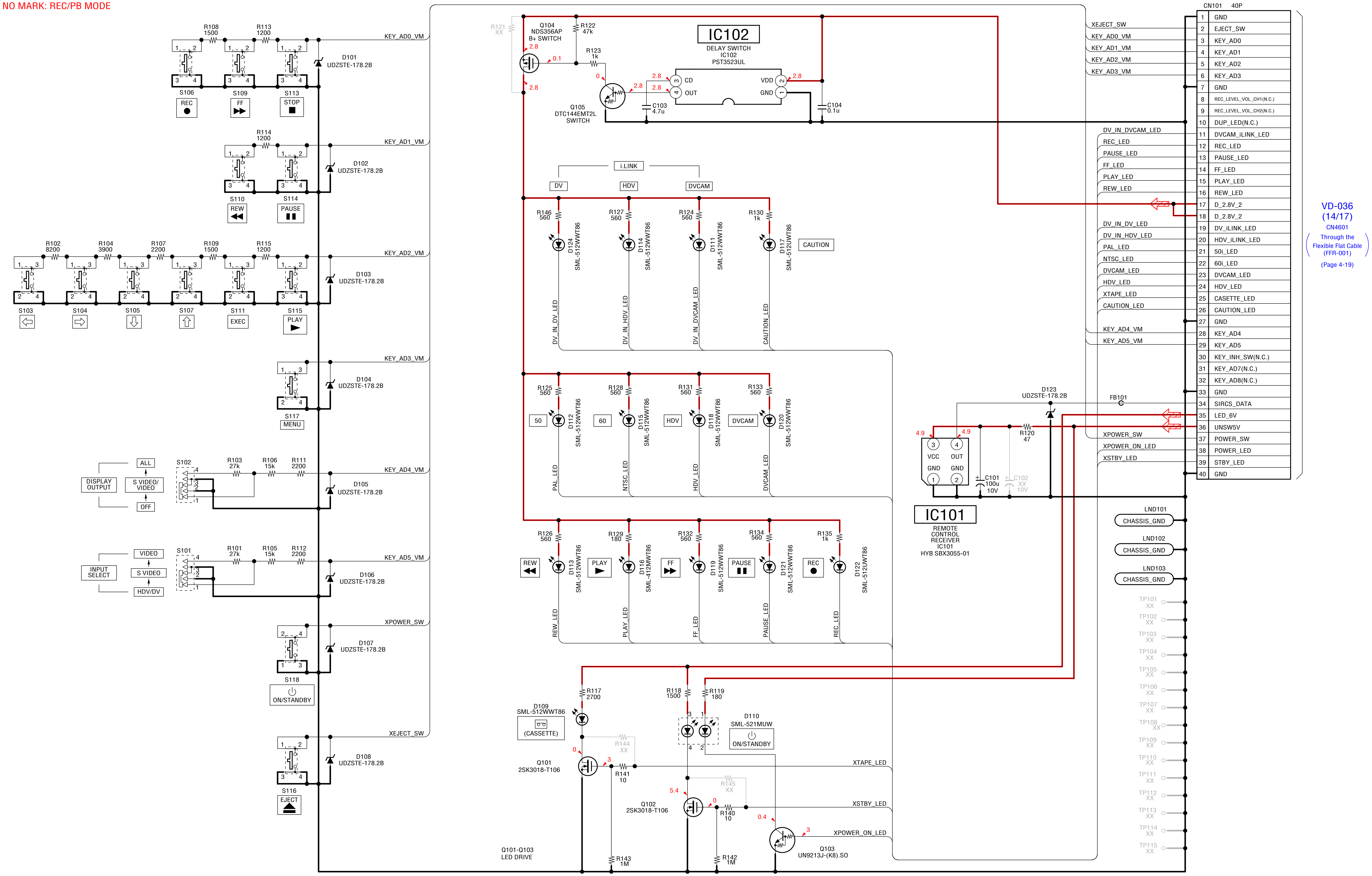


MD-76 BOARD
TAPE SENSOR
XX MARK: NO MOUNT
NO MARK: REC/PB MODE
*: IMPOSSIBLE TO MEASURE THE VOLTAGE AT THE MARKED POINTS.
FP-248 FLEXIBLE BOARD
DEW SENSOR
FP-104 FLEXIBLE BOARD
CASSETTE DETECTION SWITCH
Note: CN004 and S004 are not included in FP-104 flexible board.
IC001
ELETEN ERROR AMP
IC002
T ELETEN SENSOR
IC003
S ELETEN SENSOR
IC004
T REEL FG
IC005
S REEL FG
RP-243
CN1003
Through the Flexible Flat Cable (FRP-001)
(Page 4-5)
RP-243
CN1004
Through the Flexible Flat Cable (FRP-001)
(Page 4-5)

FR-255 BOARD

USER CONTROL

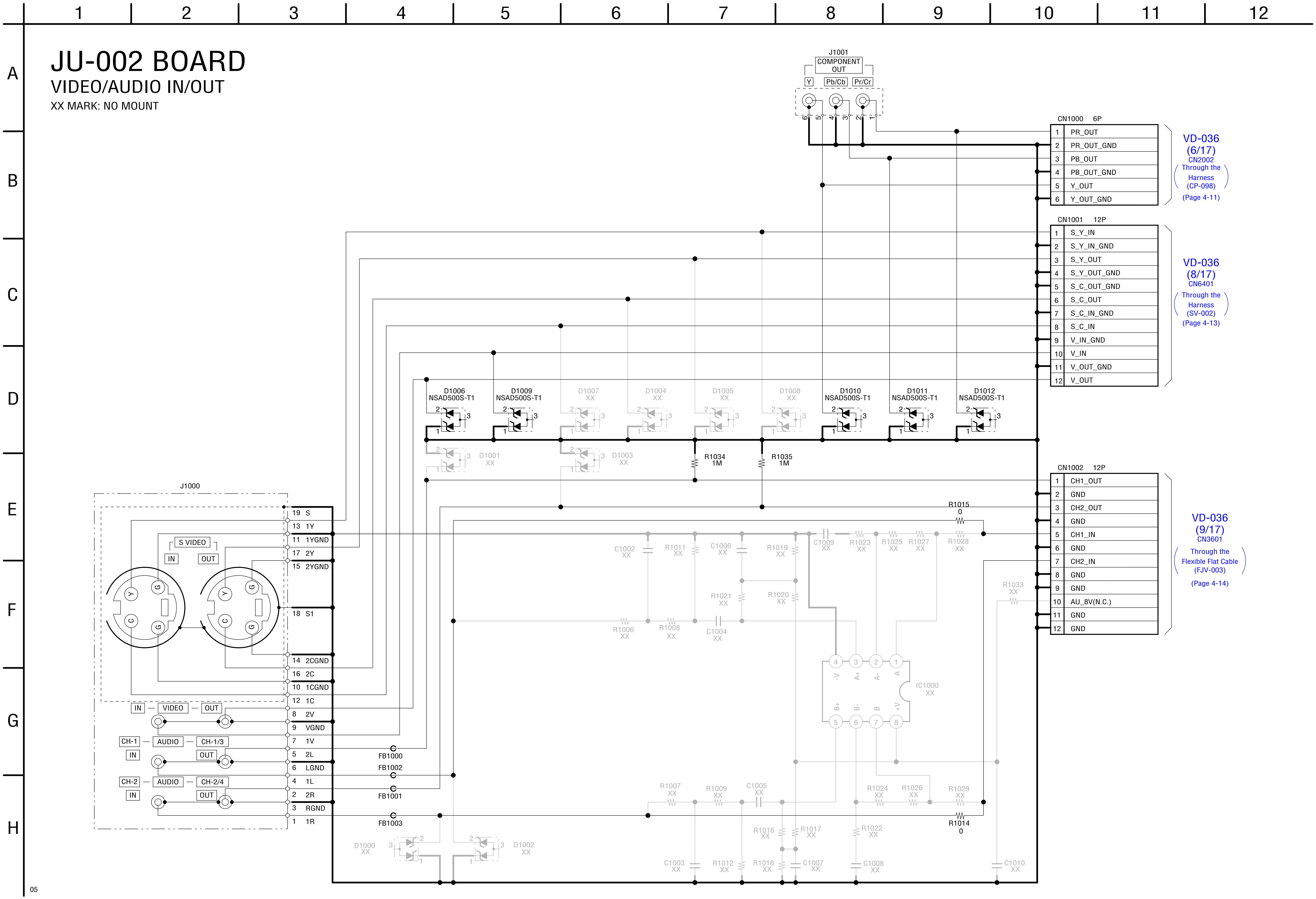
XX MARK: NO MOUNT
NO MARK: REC/PB MODE



JU-002 BOARD

VIDEO/AUDIO IN/OUT

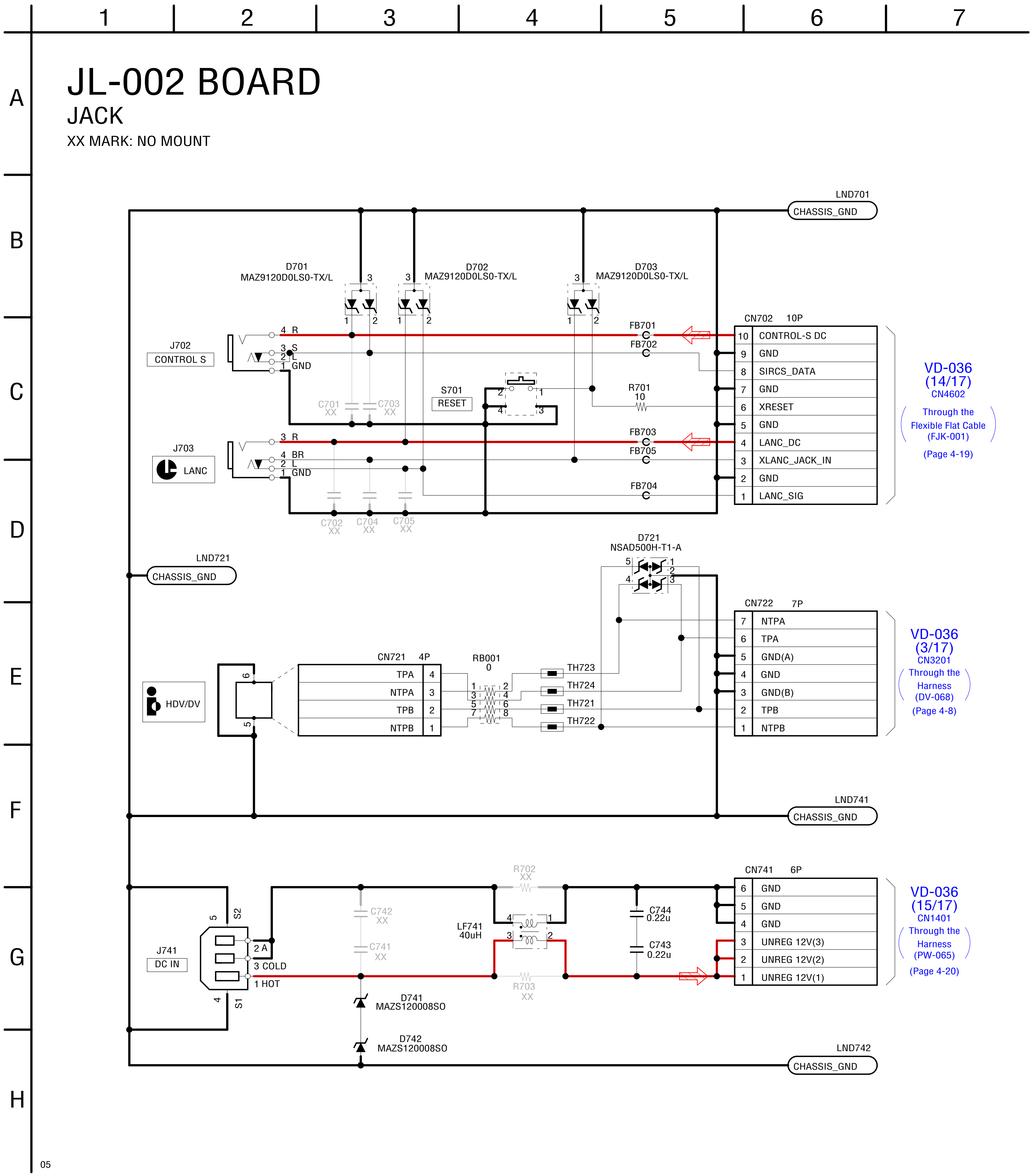
XX MARK: NO MOUNT



JL-002 BOARD

JACK

XX MARK: NO MOUNT



4-3. PRINTED WIRING BOARDS

Link

- RP-243 BOARD
- FP-104 FLEXIBLE BOARD
- VD-036 BOARD (SIDE A)
- FR-255 BOARD
- VD-036 BOARD (SIDE B)
- JU-002 BOARD
- MD-76 BOARD
- JL-002 BOARD
- FP-248 FLEXIBLE BOARD

- COMMON NOTE FOR PRINTED WIRING BOARDS
- MOUNTED PARTS LOCATION

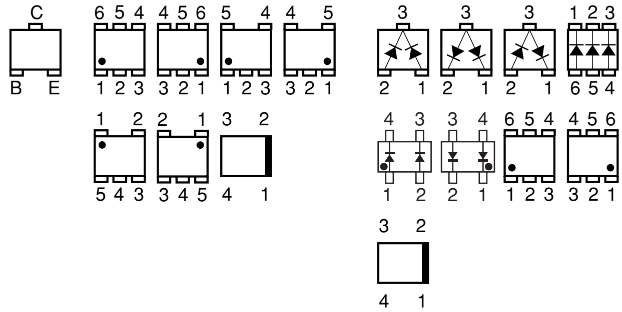
4-3. PRINTED WIRING BOARDS

(ENGLISH)

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS

- : Uses unleaded solder.
- : Circuit board
  : Flexible board
  Pattern from the side which enables seeing.
  : pattern of the rear side
  (The other layers' patterns are not indicated)
- Through hole is omitted.
- There are a few cases that the part printed on diagram isn't mounted in this model.
- : panel designation
- Chip parts.

Transistor　　Diode



(JAPANESE)

プリント図共通ノート

【プリント図ノート】

・ ：無鉛半田を使用しています。

・ ：基板

　：フレキシブル配線板

見ている面側のパターン。

　：裏側のパターン

（他のパターンについては表示されていません）

・スルーホールは省略。

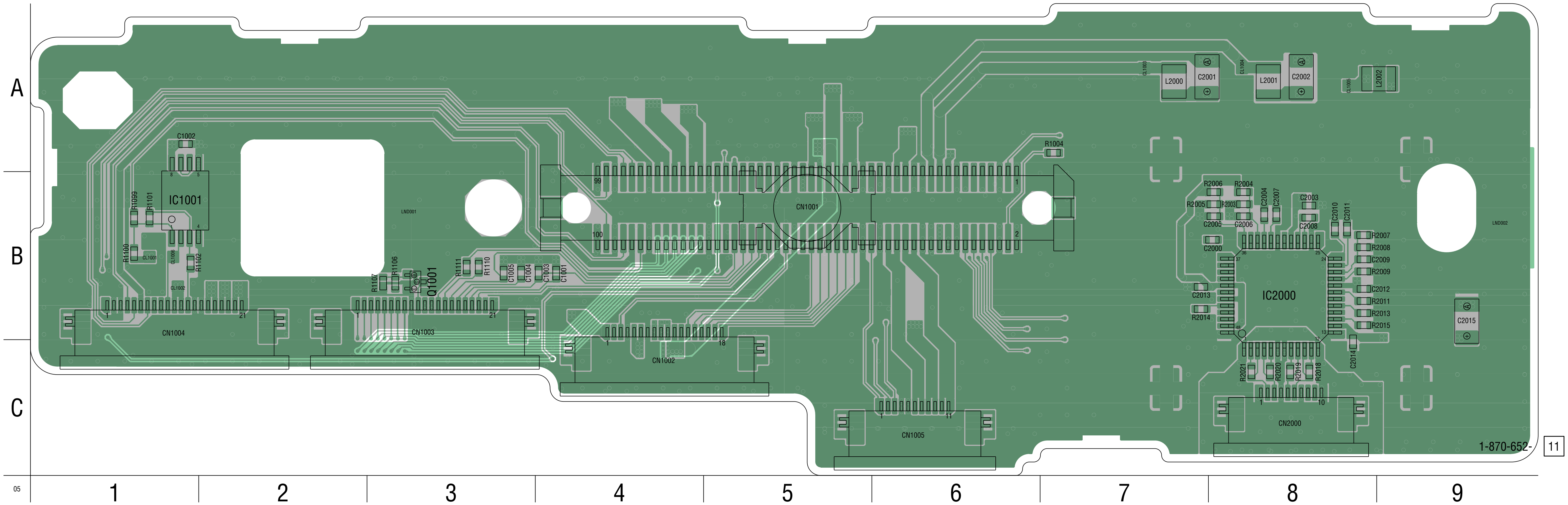
・プリント図には，本機で使用していない部品が記載されている場合があります。

・ はパネル表示名称。

RP-243 (4 layers)

: Uses unleaded solder.

RP-243 BOARD

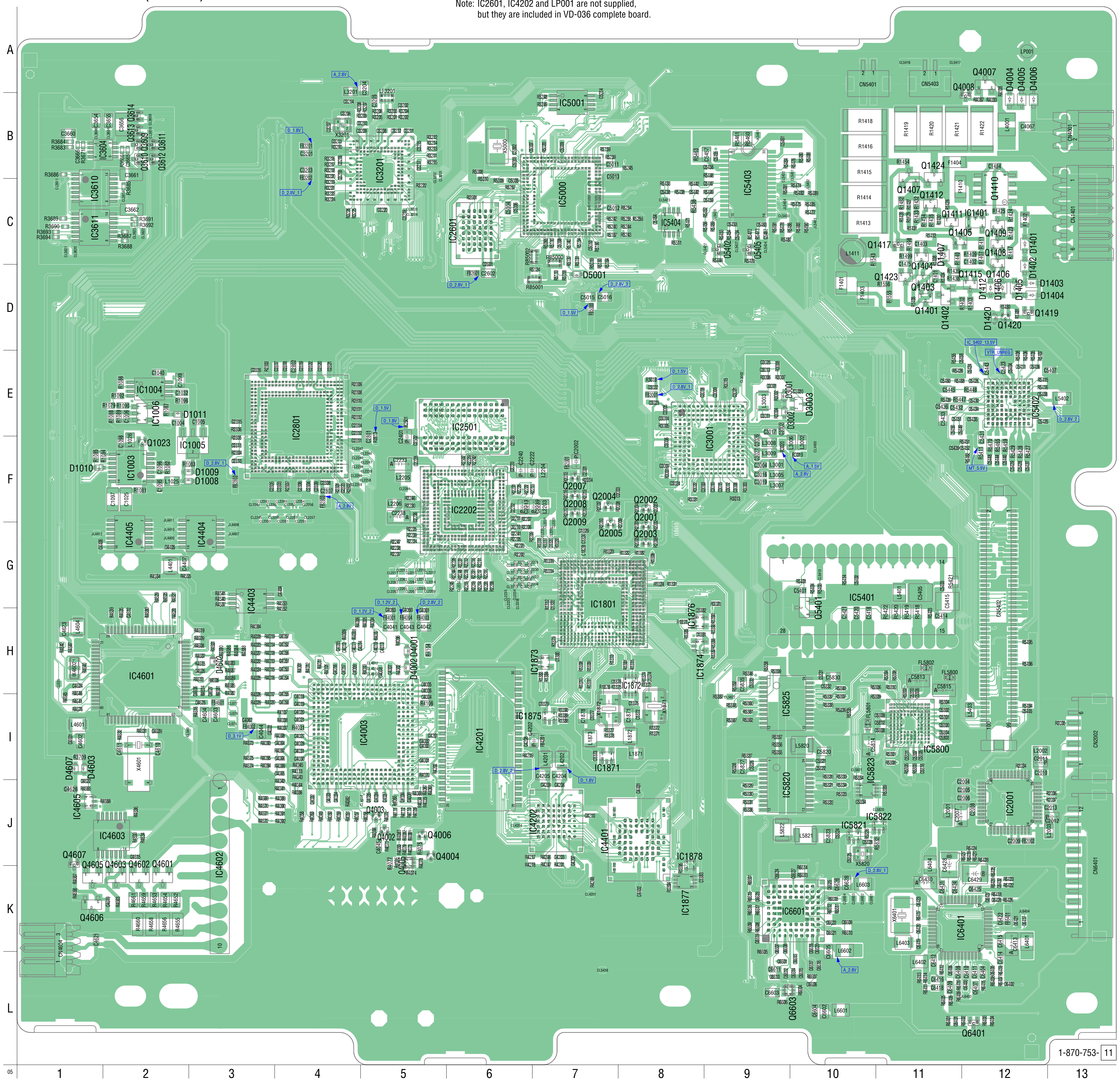


VD-036 (8 layers)

: Uses unleaded solder.

VD-036 BOARD (SIDE A)

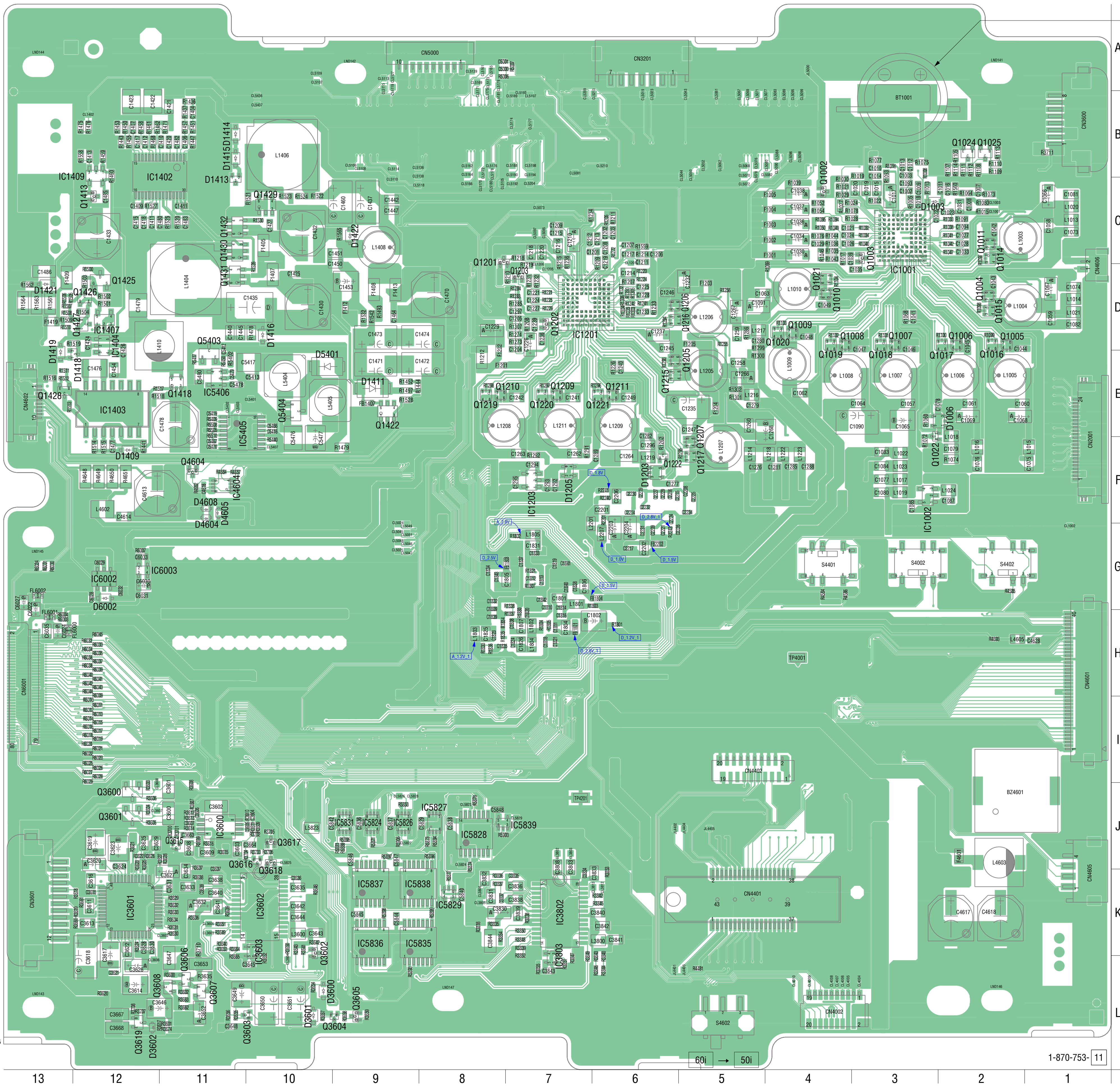
Note: IC2601, IC4202 and LP001 are not supplied, but they are included in VD-036 complete board.



VD-036 (8 layers)

: Uses unleaded solder.

VD-036 BOARD (SIDE B)



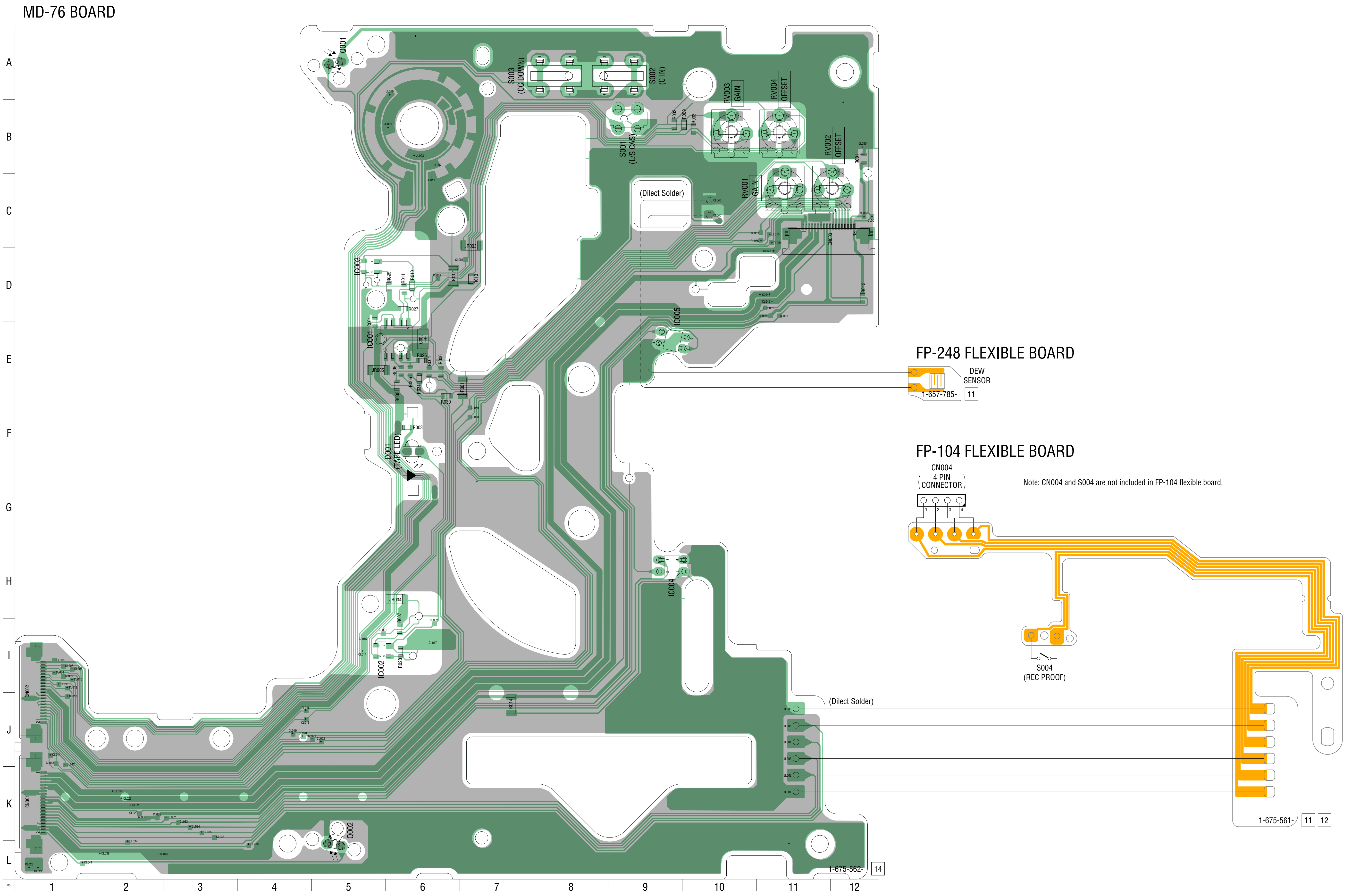
BT1001
BATTERY,
LITHIUM SECONDARY

CAUTION
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

注意
電池の交換は，正しく行わないと破裂する恐れがあります。電池を交換する場合には必ず同じ型名の電池又は同等品と交換してください。

MD-76 (2 layers), FP-248 (1 layer), FP-104 (1 layer)

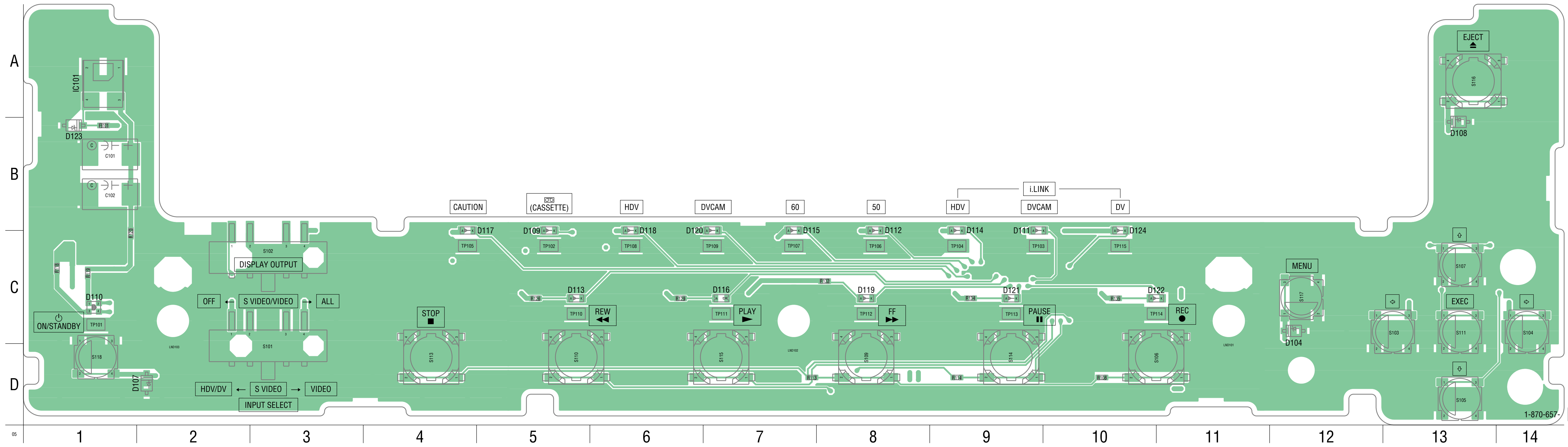
: Uses unleaded solder.



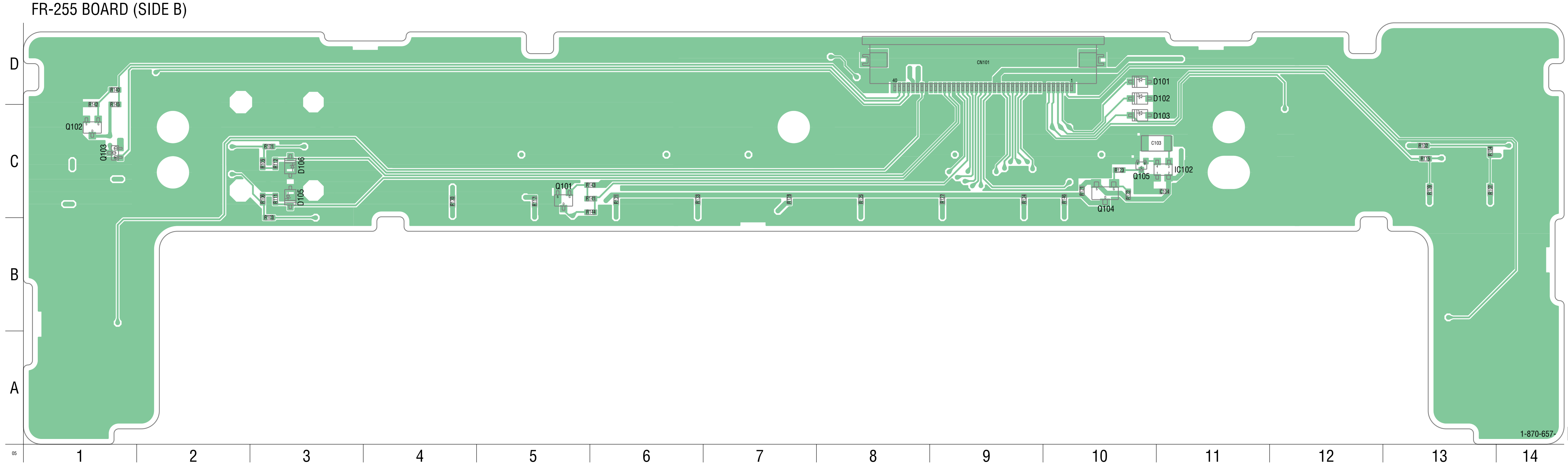
FR-255 (4 layers)

: Uses unleaded solder.

FR-255 BOARD (SIDE A)

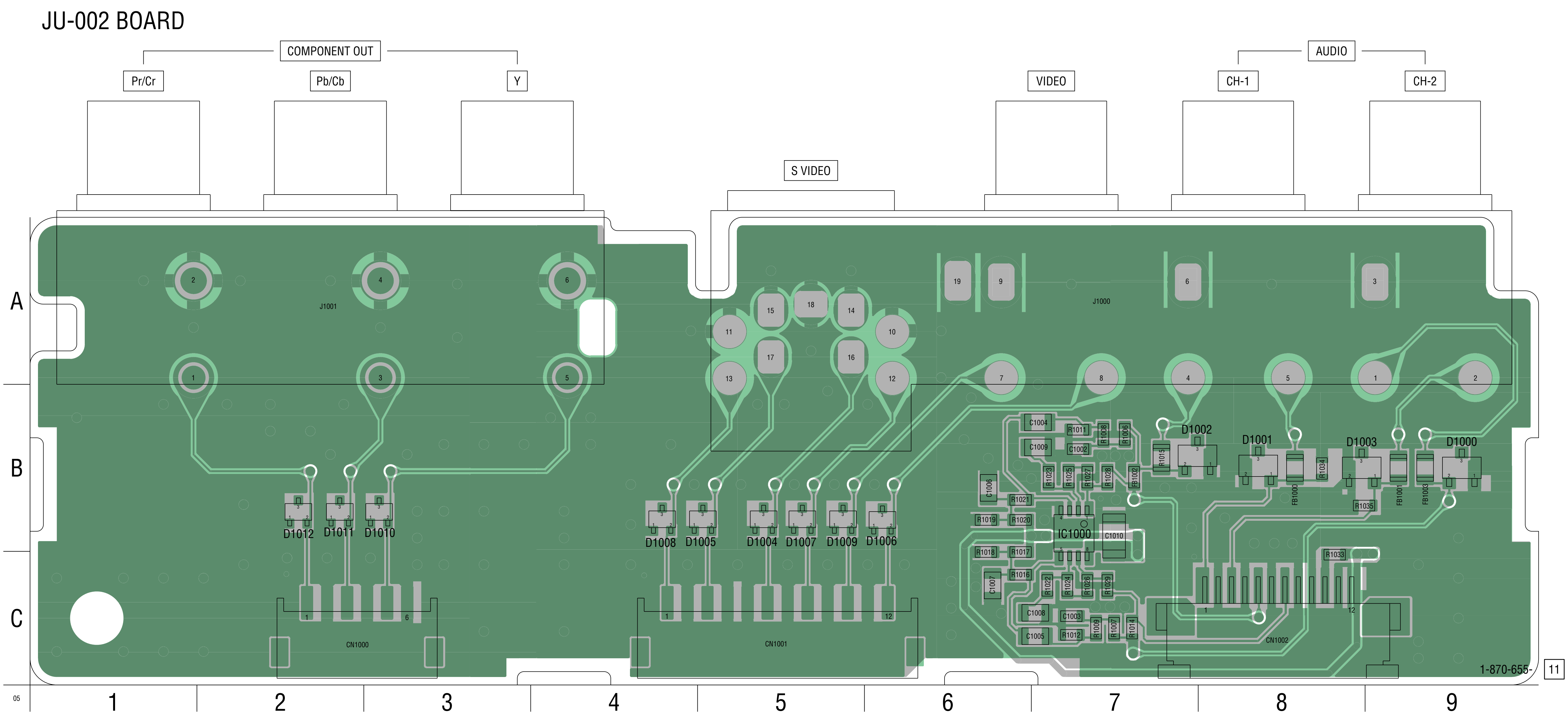


FR-255 BOARD (SIDE B)



JU-002 (2 layers)

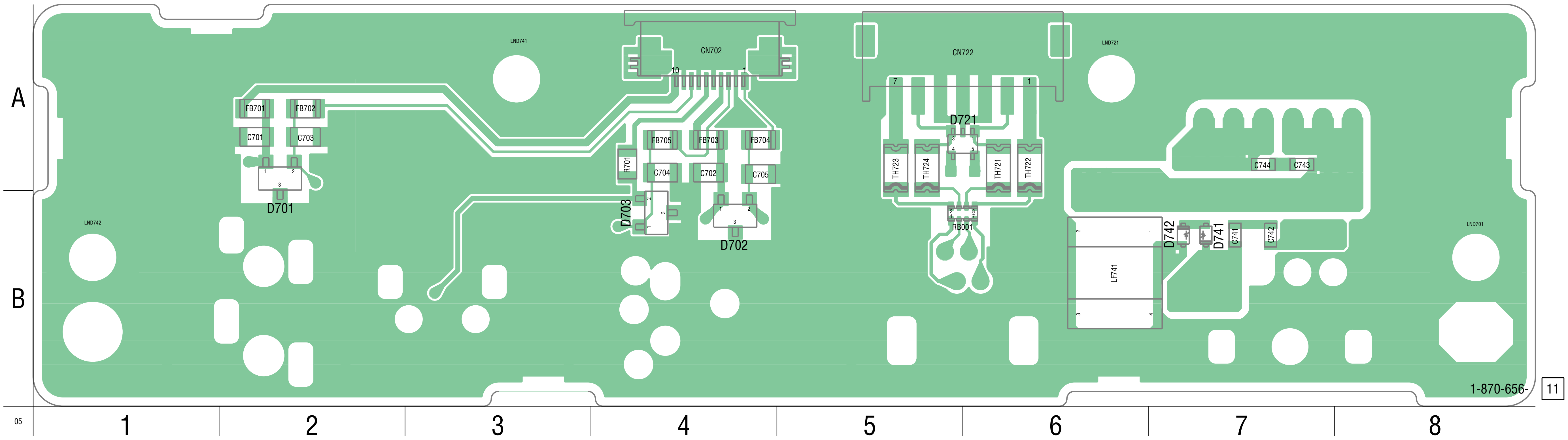
: Uses unleaded solder.



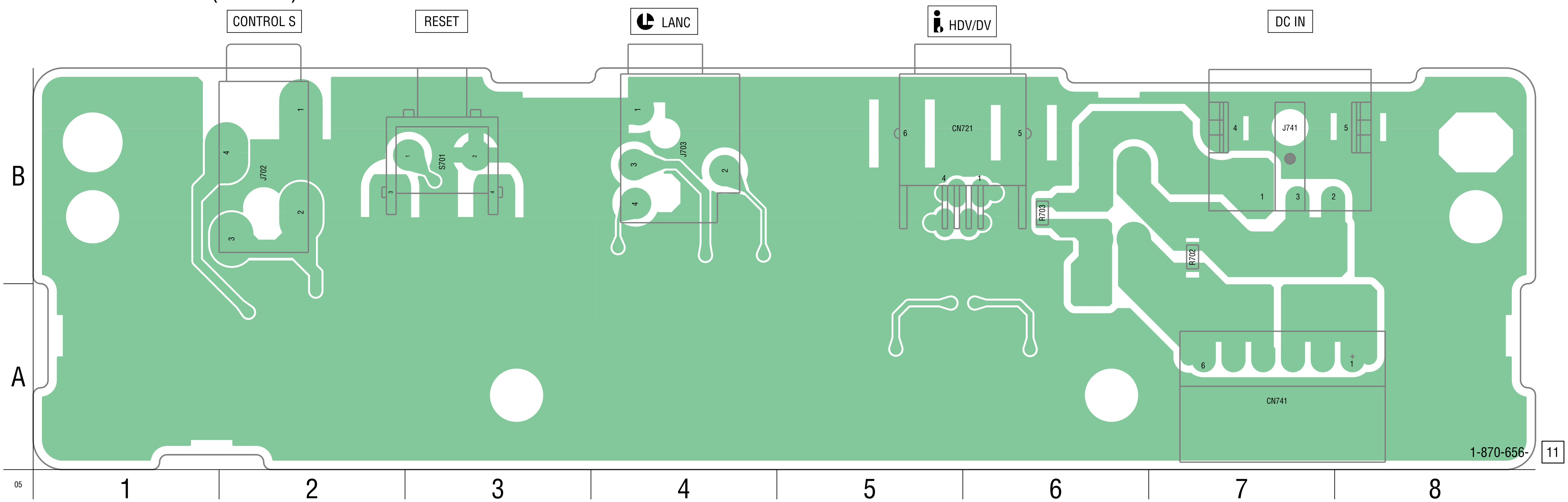
JL-002 (2 layers)

: Uses unleaded solder.

JL-002 BOARD (SIDE A)



JL-002 BOARD (SIDE B)



4-4. MOUNTED PARTS LOCATION

no mark : side A
* mark : side B

RP-243 BOARD

C1001	B-4
C1002	A-1
C1003	B-4
C1004	B-3
C1005	B-3
C2000	B-8
C2001	A-7
C2002	A-8
C2003	B-8
C2004	B-8
C2005	B-8
C2006	B-8
C2007	B-8
C2008	B-8
C2009	B-8
C2010	B-8
C2011	B-8
C2012	B-8
C2013	B-7
C2014	B-8
C2015	B-9
CN1001	B-5
CN1002	C-4
CN1003	B-3
CN1004	B-1
CN1005	C-6
CN2000	C-8
IC1001	B-1
IC2000	B-8
L2000	A-7
L2001	A-8
L2002	A-8
Q1001	B-3
R1004	A-7
R1099	B-1
R1100	B-1
R1101	B-1
R1102	B-1
R1106	B-3
R1107	B-3
R1110	B-3
R1111	B-3
R2003	B-8
R2004	B-8
R2007	B-8
R2008	B-8
R2009	B-8
R2011	B-8
R2013	B-8
R2014	B-7
R2015	B-8
R2018	C-8
R2019	C-8
R2020	C-8
R2021	C-8

VD-036 BOARD

*	BT1001	B-3
*	C1002	C-3
*	C1003	B-3
	C1004	E-2
	C1005	E-3
*	C1007	C-2
*	C1008	C-2
*	C1009	C-3
*	C1010	B-3
*	C1011	C-2
*	C1012	B-3
*	C1013	B-3
*	C1014	B-3
*	C1015	C-3
*	C1016	C-2
*	C1018	C-3
*	C1021	C-4
*	C1023	C-2
*	C1024	C-4
*	C1026	C-4
*	C1027	C-2
*	C1028	C-2
*	C1029	C-4
*	C1030	C-4
*	C1031	C-2
*	C1033	C-2
*	C1034	C-4
*	C1036	C-4
*	C1037	C-4
*	C1038	C-4
*	C1041	D-3
*	C1042	C-2
*	C1043	D-2
*	C1044	D-2
*	C1045	D-2
*	C1046	D-3
*	C1047	D-3
*	C1048	D-4
*	C1057	E-3
*	C1058	C-1
*	C1059	D-1
*	C1060	E-2
*	C1061	E-2
*	C1062	E-4
*	C1064	E-3
*	C1073	C-1
*	C1074	D-1
*	C1075	F-1
*	C1076	F-2
*	C1077	F-3
*	C1078	E-2
*	C1079	F-2
*	C1080	F-3
*	C1081	C-1
*	C1082	D-1
*	C1083	F-3
*	C1084	F-3
*	C1085	F-3
*	C1087	F-2
*	C1090	E-3
*	C1093	C-3
*	C1094	C-2
	C1095	F-2
	C1096	F-2
	C1097	F-2
	C1098	F-2
	C1099	E-2
*	C1201	C-6
*	C1202	C-6
*	C1203	C-6
*	C1204	D-7
*	C1205	D-7
*	C1206	C-6
*	C1207	C-6
*	C1208	C-6
*	C1209	C-7
*	C1211	C-6
*	C1212	C-7
*	C1213	C-6
*	C1214	D-6
*	C1215	C-7
*	C1216	C-7
*	C1217	C-6
*	C1219	C-6
*	C1221	D-7
*	C1224	D-7
*	C1225	D-6
*	C1226	D-7
*	C1227	D-7
*	C1228	D-6
*	C1229	D-8
*	C1232	D-5
*	C1233	D-6
*	C1235	E-5
*	C1237	D-6
*	C1240	E-6
*	C1241	E-7
*	C1242	E-7
*	C1245	D-6
*	C1246	D-6
*	C1247	E-5
*	C1249	E-6
*	C1258	E-5
*	C1259	D-5
*	C1260	E-5
*	C1262	F-7
*	C1263	F-7
*	C1264	F-6
*	C1276	F-5
*	C1277	F-6
*	C1279	E-5
*	C1280	D-5
*	C1281	F-4
*	C1282	E-6
*	C1285	F-4
*	C1288	F-4
*	C1289	F-6
*	C1292	F-7
*	C1293	F-7
*	C1294	F-7
*	C1295	F-7
*	C1296	F-6
*	C1297	D-7
	C1401	D-11
	C1402	C-12
*	C1404	B-11
*	C1406	B-11
*	C1407	B-12
*	C1409	C-12
*	C1410	B-11
*	C1411	C-12
*	C1412	B-12
*	C1413	B-12
*	C1415	C-12
*	C1417	B-12
*	C1418	C-12
*	C1420	B-11
*	C1421	B-11
*	C1422	B-12
*	C1423	B-12
*	C1424	D-12
*	C1425	D-10
*	C1426	D-12
*	C1430	D-10
*	C1433	C-12
*	C1435	D-10
*	C1440	D-11
*	C1445	D-11
*	C1450	C-9
*	C1451	C-9
*	C1453	D-9
*	C1454	E-12
*	C1464	D-9
*	C1470	D-8
*	C1471	E-9
*	C1472	E-8
*	C1473	D-9
*	C1474	D-8
	C1475	C-11
*	C1476	E-12
*	C1477	F-12
*	C1478	E-11
*	C1479	D-12
*	C1480	C-11
*	C1481	C-11
*	C1482	B-11
*	C1483	C-11
	C1484	B-12
*	C1485	C-12
*	C1801	G-7
*	C1802	H-6
*	C1804	H-7
*	C1805	G-7
*	C1806	G-7
*	C1807	H-7
*	C1808	H-7
*	C1809	G-8
*	C1810	G-7
*	C1811	H-7
*	C1812	G-7
*	C1813	G-7
*	C1814	G-7
*	C1816	H-7
*	C1818	H-7
*	C1819	G-7
*	C1820	H-7
*	C1821	H-7
	C1822	G-7
*	C1823	H-8
*	C1824	H-7
*	C1825	H-8
*	C1826	H-7
	C1827	G-7
	C1828	G-7
	C1829	G-7
	C1830	G-7
*	C1831	G-7
*	C1832	G-8
*	C1833	G-7
*	C1834	G-8
*	C1835	H-8
*	C1837	G-7
*	C1838	G-7
*	C1839	H-8
*	C1840	G-7
*	C1841	G-7
*	C1842	G-7
*	C1843	G-8
	C1871	I-8
	C1872	I-8
	C1873	I-7
	C1875	I-8
	C1877	I-7
	C1878	I-7
	C1879	I-7
	C1880	H-7
	C1881	H-8
	C1882	H-8
	C2001	F-7
	C2002	F-7
	C2003	F-7
	C2004	J-12
	C2005	J-12
	C2006	J-12
	C2007	J-11
	C2008	J-12
	C2009	J-12
	C2010	I-12
	C2011	I-12
	C2012	J-13
	C2013	J-13
*	C2201	F-6
*	C2202	G-6
*	C2203	G-6
*	C2204	G-6
*	C2206	F-6
*	C2208	F-5
*	C2209	G-6
	C2210	G-6
	C2211	F-6
	C2212	F-6
	C2213	F-6
*	C2214	F-6
*	C2215	F-6
*	C2216	F-6
*	C2217	G-6
*	C2219	F-6
	C2220	F-6
*	C2221	G-6
	C2222	F-6
*	C2224	F-6
*	C2225	F-5
*	C2226	G-6
*	C2227	F-6
	C2228	F-5
*	C2229	F-6
*	C2230	F-6
*	C2231	G-6
*	C2232	F-6
	C2233	F-5
*	C2234	F-5
	C2236	F-5
	C2238	F-5
	C2239	F-7
	C2240	F-6
	C2401	F-5
	C2502	F-5
	C2503	F-6
	C2601	C-6
	C2602	D-6
	C2801	F-5
	C2802	E-4
	C2803	F-4
	C2804	F-4
	C2805	F-3
	C2806	F-4
	C2807	F-4
	C2808	F-4
	C2809	F-4
	C2810	F-3
	C2811	F-4
	C2812	E-4
	C2813	F-3
	C2814	E-4
	C2815	E-3
	C2816	E-3
	C2817	E-4
	C2818	E-4
	C2819	E-4
	C2820	E-4
	C2821	E-4
	C2822	E-4
	C3001	E-9
	C3002	E-9
	C3003	F-8
	C3004	F-9
	C3005	E-8
	C3006	F-8
	C3008	F-9
	C3009	E-9
	C3010	F-9
	C3011	E-9
	C3012	F-9
	C3013	E-9
	C3015	F-9
	C3016	F-9
	C3017	E-9
	C3018	E-8
	C3019	F-9
	C3020	E-10
	C3021	E-9
	C3022	E-8
	C3023	E-8
	C3024	F-8
	C3025	E-9
	C3026	F-9
	C3027	F-9
	C3201	B-4
	C3202	B-5
	C3203	B-4
	C3204	A-5
	C3205	B-5
	C3206	B-4
	C3207	B-4
	C3208	B-5
	C3209	B-5
	C3210	B-5
	C3211	B-5
	C3212	B-5
	C3214	B-4
	C3215	B-5
	C3216	B-4
	C3217	B-5
	C3218	B-4
	C3219	C-5
	C3220	C-5
*	C3600	J-11
*	C3601	J-11
*	C3602	J-11
*	C3603	J-11
*	C3604	J-10
*	C3605	J-10
*	C3606	J-11
*	C3607	J-11
*	C3608	J-11
*	C3609	J-11
*	C3611	K-12
*	C3613	K-12
*	C3614	L-12
*	C3615	K-12
*	C3616	K-12
*	C3617	L-12
*	C3618	L-12
*	C3619	J-12
*	C3620	J-12
*	C3621	L-12
*	C3622	K-12
*	C3623	J-12
*	C3624	J-12
*	C3625	J-12
*	C3626	L-12
*	C3627	K-11
*	C3628	K-12
*	C3629	J-12
*	C3630	K-12
*	C3631	K-11
*	C3632	K-11
*	C3633	K-11
*	C3634	K-11
*	C3635	K-10
*	C3636	K-10
*	C3637	J-11
*	C3638	K-11
*	C3639	K-11
*	C3640	K-11
*	C3641	K-11
*	C3642	K-10
*	C3643	K-10
*	C3644	K-10
*	C3645	L-10
*	C3646	L-12
*	C3647	L-11
*	C3648	L-11
*	C3649	L-11
*	C3650	L-10
*	C3651	L-10
*	C3652	L-11
*	C3653	L-11
*	C3663	J-11
*	C3664	J-10
*	C3667	L-12
*	C3668	L-12
	C4001	I-5
	C4002	I-5
	C4003	I-5
	C4004	I-5
	C4005	H-5
	C4006	H-5
	C4007	H-5
	C4008	H-5
	C4009	H-4
	C4010	H-5
	C4011	H-4
	C4012	H-4
	C4013	H-5
	C4014	H-4
	C4015	H-4
	C4016	H-4
	C4017	H-4
	C4018	I-4
	C4019	I-4
	C4020	I-4
	C4028	I-4
	C4030	I-4
	C4031	I-4
	C4032	J-4
	C4033	J-4
	C4034	J-4
	C4035	J-5

4-3. PRINTED WIRING BOARDS

no mark : side A
* mark : side B

C4036 J-5
C4037 J-5
C4038 J-5
C4039 J-5
C4041 H-5
C4042 H-5
C4043 H-5
C4044 I-3
C4045 J-5
C4060 H-5
C4061 H-5
C4062 I-3
C4063 H-5
C4067 B-12
C4201 I-5
C4202 I-7
C4204 I-7
C4205 I-7
C4208 I-6
C4209 J-7
C4401 J-8
C4402 K-8
C4404 G-4
C4601 I-1
C4602 I-1
C4603 I-3
C4604 I-3
C4605 H-3
C4606 H-3
C4609 I-2
C4610 I-2
C4611 I-2
C4612 H-2
* C4613 F-12
* C4614 F-12
C4615 J-2
* C4616 F-11
C4623 H-1
C4624 H-1
C4625 I-3
C4626 J-1
C4627 H-3
* C5000 A-8
* C5001 A-8
C5002 B-6
C5003 B-6
C5004 C-6
C5005 C-6
C5006 C-6
C5007 B-6
C5008 C-7
C5009 B-7
C5010 C-7
C5011 B-7
C5012 C-7
C5013 B-7
C5014 B-7
C5015 D-7
C5016 D-7
C5401 G-10
C5402 G-10
C5403 G-11
C5404 E-12
C5405 G-11
C5406 E-12
C5407 E-13
C5408 E-12
C5411 E-12
* C5412 D-11
* C5413 E-10
C5414 H-11
C5415 G-11
* C5416 E-10
* C5417 E-10
C5418 H-10
* C5419 E-11
C5420 H-10
C5421 H-10
C5423 E-12
C5424 E-12
C5425 E-12
C5427 F-12
C5428 F-12
C5429 F-12

C5430 E-12
C5431 F-12
C5432 E-11
C5434 E-12
C5435 E-12
C5436 E-11
C5438 C-8
C5439 F-11
C5440 F-12
C5442 C-8
C5443 E-12
C5444 F-12
C5447 C-9
C5448 F-12
C5449 E-11
C5450 E-11
C5451 E-11
C5452 F-12
C5453 C-9
C5454 C-9
C5455 B-9
C5456 B-9
C5457 B-9
C5458 E-11
C5459 C-9
C5460 E-11
C5461 B-9
C5462 C-9
C5463 C-9
C5464 C-8
C5465 I-12
* C5466 E-10
* C5467 F-11
* C5470 F-11
* C5476 E-10
* C5477 E-10
* C5478 E-11
* C5479 E-11
* C5480 E-11
C6401 L-11
C6402 L-12
C6403 L-12
C6404 L-12
C6405 L-12
C6406 L-11
C6407 L-12
C6408 L-11
C6409 L-11
C6410 L-12
C6411 L-12
C6412 L-11
C6413 K-12
C6414 L-12
C6415 K-12
C6416 L-11
C6417 K-12
C6418 L-11
C6419 K-11
C6420 K-11
C6421 K-12
C6422 K-12
C6424 K-11
C6425 K-12
C6426 K-12
C6427 K-12
C6428 J-11
C6429 K-12
C6430 K-11
C6431 K-11
C6601 L-9
C6602 L-10
C6603 L-9
C6604 L-10
C6605 K-10
C6606 L-10
C6607 K-9
C6608 K-9
C6609 K-10
C6610 L-9
C6611 L-9
C6612 L-9
C6613 L-10
C6614 L-10
C6615 L-10

C6616 L-10
C6617 L-10
C6618 K-10
C6619 K-9
C6620 K-10
C6621 K-10
C6622 K-10
C6624 K-9
C6625 K-10
C6626 K-10
C6627 K-10
C6628 K-10

CN1401 C-13
CN2002 I-13
* CN3201 A-6
* CN3601 K-13
CN4001 B-13
* CN4002 L-4
* CN4601 H-1
* CN4602 E-13
CN5401 A-10
CN5402 G-12
CN5403 A-11
CN6401 J-13

* D1003 C-3
* D1006 E-2
D1008 F-3
D1009 F-3
D1010 F-1
D1011 E-2
* D1203 F-6
* D1205 F-7
D1401 C-12
D1402 D-12
D1403 D-12
D1404 D-12
D1405 D-12
D1406 D-12
D1407 C-11
* D1409 F-12
* D1411 E-9
* D1413 C-11
* D1416 D-10
* D1418 E-12
* D1419 E-13
D1420 D-12
D3001 E-9
D3002 E-10
D3003 E-10
* D3600 L-10
* D3601 L-10
* D3602 L-12
D4001 H-5
D4002 H-5
D4004 B-12
D4005 B-12
D4006 B-12
D4603 I-1
* D4604 F-11
* D4605 F-11
D5001 D-7
* D5401 E-10

* F1001 C-4
* F1002 C-4
* F1003 C-4
* F1004 C-4
* F1005 C-4
* F1201 E-8
* F1202 E-8
* F1203 D-5
* F1204 E-5
* F1205 D-5
F1401 D-10
F1402 C-12
F1403 D-10
F1404 B-11
* F1407 D-10
* F1409 D-13
F1410 C-11
* F1412 D-9
* F1413 D-9

* F1419 D-13

* FB1407 E-9
* FB1801 H-7
* FB1803 G-7
* FB1804 G-6
FB2001 F-7
FB2002 J-12
* FB2202 G-6
FB2601 D-6
FB2802 F-3
FB2803 F-4
FB3001 E-8
FB3201 B-4
FB3202 B-4
FB4001 H-5
FB4002 I-3
FB4003 H-5
FB4004 H-5
FB4201 I-7
FB4601 I-3
FB5000 D-7
FB6401 K-12

* IC1001 C-3
* IC1002 F-3
IC1003 F-2
IC1004 E-2
IC1005 F-3
IC1006 E-2
* IC1201 D-7
* IC1203 F-7
IC1401 C-12
* IC1402 B-11
* IC1403 E-12
* IC1404 D-12
* IC1407 D-12
* IC1409 B-12
IC1801 G-7
IC1871 I-7
IC1872 H-8
IC1873 H-7
IC1874 H-8
IC1875 I-7
IC1876 H-8
IC2001 J-12
IC2202 F-6
IC2501 E-6
IC2601 C-6
IC2801 E-4
IC3001 F-9
IC3201 B-5
* IC3600 J-11
* IC3601 K-12
* IC3602 K-10
* IC3603 K-10
IC4003 I-5
IC4201 I-6
IC4202 J-7
IC4403 G-3
IC4601 H-2
* IC4604 F-11
IC5000 C-7
IC5001 B-7
IC5401 G-10
IC5402 E-12
IC5403 C-9
IC5404 C-8
* IC5405 E-11
* IC5406 E-11
IC6401 K-11
IC6601 K-10

* L1003 C-2
* L1004 D-2
* L1005 E-2
* L1006 E-2
* L1007 E-3
* L1008 E-4
* L1009 E-4
* L1013 C-1
* L1014 D-1
* L1015 F-1
* L1016 F-2

* L1017 F-3
* L1018 E-2
* L1019 F-3
* L1020 C-1
* L1021 D-1
* L1022 F-3
* L1023 F-3
* L1024 F-2
L1025 F-2
L1026 F-2
* L1205 E-5
* L1206 D-5
* L1207 F-5
* L1208 E-8
* L1209 E-6
* L1211 E-7
* L1214 F-5
* L1216 E-5
* L1217 D-5
* L1218 F-4
* L1219 F-6
* L1222 F-4
* L1223 F-4
* L1404 D-11
* L1406 B-10
* L1410 D-11
* L1801 G-7
* L1802 H-7
* L1803 H-8
* L1804 H-7
* L1805 G-7
L1871 I-8
L1872 I-8
L1873 I-7
L2001 J-11
L2002 I-12
L2003 J-13
* L2201 G-7
L2203 F-7
L2204 F-7
L2205 F-5
L2206 F-5
* L2207 G-6
L3001 F-9
L3002 F-10
L3003 E-9
L3005 F-9
L3006 F-10
L3007 F-9
L3008 F-9
L3009 F-9
L3201 A-4
* L3600 K-10
L4001 B-12
L4201 I-7
L4202 I-7
L4601 I-1
* L4602 F-12
L4604 H-1
* L4605 H-2
L5401 G-11
L5402 E-13
L5403 I-12
* L5404 E-10
* L5405 E-10
L6401 K-12
L6402 L-11
L6403 K-11
L6404 J-11
L6601 L-10
L6602 K-10
L6603 K-10

LF3201 B-5

LP001 A-12

* Q1002 C-4
* Q1003 C-3
* Q1004 D-2
* Q1005 D-2
* Q1006 D-2
* Q1007 D-3
* Q1008 D-4

* Q1009 D-4
* Q1011 C-2
* Q1014 C-2
* Q1015 D-2
* Q1016 D-2
* Q1017 D-2
* Q1018 D-3
* Q1019 D-4
* Q1020 D-4
* Q1022 F-3
Q1023 F-2
* Q1024 B-2
* Q1025 B-2
* Q1201 C-8
* Q1202 D-7
* Q1203 D-7
* Q1205 E-6
* Q1206 D-6
* Q1207 F-5
* Q1209 E-7
* Q1210 E-8
* Q1211 E-6
* Q1215 E-6
* Q1216 D-6
* Q1217 F-5
* Q1219 E-8
* Q1220 E-7
* Q1221 E-6
* Q1222 F-6
Q1401 D-11
Q1402 D-11
Q1403 D-11
Q1404 C-11
Q1405 C-11
Q1406 C-12
Q1407 B-11
Q1408 C-12
Q1409 C-12
Q1410 C-12
Q1411 C-11
Q1412 C-11
Q1415 D-12
Q1417 C-11
* Q1418 E-11
Q1419 D-12
Q1420 D-12
* Q1422 E-9
Q1423 D-11
Q1424 B-11
* Q1425 D-12
* Q1426 D-12
* Q1427 D-12
* Q1428 E-13
* Q1430 C-11
* Q1431 D-11
Q2001 G-8
Q2002 F-8
Q2003 G-8
Q2004 F-7
Q2005 G-7
Q2007 F-7
Q2008 F-7
Q2009 F-7
* Q3600 J-12
* Q3601 J-12
* Q3602 K-10
* Q3603 L-10
* Q3604 L-9
* Q3605 L-9
* Q3606 L-11
* Q3607 L-11
* Q3608 L-11
* Q3615 J-11
* Q3616 J-10
* Q3617 J-10
* Q3618 J-10
* Q3619 L-12
Q4002 J-5
Q4003 J-5
Q4004 J-5
Q4005 J-5
Q4006 J-5
Q4007 A-12
Q4008 B-12

4-3. PRINTED WIRING BOARDS

no mark : side A
* mark : side B

Mark	Ref. No.	Location
*	Q4604	F-11
	Q5401	G-10
	Q5402	C-9
*	Q5403	E-11
*	Q5404	E-10
	Q5405	C-9
	Q6401	L-12
	Q6603	L-9
*	R1016	B-3
*	R1017	C-4
*	R1022	C-3
*	R1029	C-4
*	R1030	C-4
*	R1032	C-3
*	R1033	C-2
*	R1034	C-3
*	R1035	C-4
*	R1036	C-4
*	R1038	C-2
*	R1039	C-4
*	R1040	C-3
*	R1041	C-2
*	R1042	C-2
*	R1043	C-4
*	R1044	C-4
*	R1046	C-4
*	R1047	C-2
*	R1049	C-4
*	R1050	C-4
*	R1052	C-4
*	R1054	C-4
*	R1060	E-3
*	R1064	C-2
*	R1068	D-3
*	R1072	F-3
*	R1073	C-2
*	R1075	B-3
*	R1076	C-4
	R1081	F-2
	R1082	F-2
	R1084	F-2
	R1085	F-1
	R1086	E-2
	R1087	E-2
	R1088	E-2
	R1089	E-2
	R1090	E-2
	R1092	E-2
*	R1093	B-3
*	R1094	C-4
*	R1095	C-4
	R1096	E-2
*	R1097	C-2
*	R1098	D-2
*	R1099	D-2
*	R1100	D-2
*	R1101	D-3
*	R1102	D-4
*	R1103	D-4
*	R1105	B-2
*	R1107	B-2
*	R1108	B-2
*	R1109	B-2
*	R1110	B-2
*	R1111	B-2
*	R1112	B-2
*	R1113	B-2
*	R1114	B-2
*	R1205	C-6
*	R1207	D-6
*	R1208	D-7
*	R1210	D-7
*	R1211	C-6
*	R1212	E-8
*	R1214	C-6
*	R1215	C-7
*	R1218	C-7
*	R1219	C-7
*	R1221	D-7
*	R1223	D-6
*	R1224	D-6
*	R1225	D-7
*	R1226	E-6
*	R1227	D-6
*	R1229	D-7
*	R1230	D-6
*	R1231	D-7
*	R1232	D-7
*	R1233	D-6
*	R1234	C-7
*	R1235	D-6
*	R1236	C-7
*	R1241	D-6
*	R1242	D-6
*	R1255	D-5
*	R1256	D-5
*	R1262	F-6
*	R1273	D-7
*	R1274	D-7
*	R1285	D-7
*	R1286	D-5
*	R1291	F-7
*	R1292	F-7
*	R1293	E-6
*	R1294	D-6
*	R1295	F-5
*	R1296	E-6
*	R1297	E-7
*	R1298	E-8
*	R1302	E-5
*	R1307	D-7
	R1402	D-12
	R1403	D-12
	R1404	D-11
	R1405	D-11
	R1407	C-12
	R1408	C-11
	R1409	C-12
	R1411	C-12
	R1412	C-11
	R1417	C-12
	R1423	C-12
	R1424	C-12
	R1425	C-12
	R1426	C-11
	R1427	C-11
	R1428	C-11
	R1429	C-11
	R1430	C-11
	R1431	C-11
	R1432	C-11
	R1433	C-11
	R1434	C-11
*	R1436	B-11
*	R1437	B-11
	R1438	D-11
	R1439	D-11
	R1440	C-11
*	R1441	F-12
*	R1443	B-12
*	R1444	E-9
*	R1447	B-11
*	R1450	B-12
*	R1451	B-11
*	R1452	E-9
*	R1453	B-12
*	R1455	B-12
*	R1457	B-11
*	R1458	B-12
*	R1459	B-12
*	R1460	B-12
*	R1461	B-12
*	R1462	B-12
*	R1468	B-12
*	R1476	B-12
*	R1478	D-10
*	R1479	F-9
	R1480	D-12
	R1481	D-12
	R1482	C-11
*	R1497	E-9
	R1498	C-11
	R1499	C-11
*	R1500	D-12
*	R1501	D-12
*	R1502	D-12
*	R1503	D-12
*	R1504	D-12
*	R1505	D-13
*	R1506	D-13
*	R1507	D-13
*	R1508	D-13
*	R1509	D-13
*	R1510	D-13
*	R1511	E-13
*	R1512	E-13
*	R1513	E-13
*	R1514	F-12
*	R1515	F-12
*	R1516	E-13
*	R1517	E-12
*	R1518	E-12
*	R1519	D-12
*	R1520	C-11
*	R1523	C-10
*	R1524	C-10
*	R1525	C-11
*	R1526	D-10
*	R1527	C-12
*	R1528	E-9
*	R1532	D-9
*	R1542	D-9
	R1555	D-11
	R1556	D-11
*	R1558	B-12
*	R1565	C-9
*	R1801	H-6
*	R1802	G-7
*	R1803	G-6
*	R1804	H-7
	R1806	G-8
*	R1807	G-7
	R1808	H-7
	R1809	H-7
	R1810	H-7
	R1811	H-7
	R1812	G-7
	R1813	H-7
	R1814	G-7
	R1815	H-8
	R1817	G-7
	R1818	G-7
	R1819	G-7
	R1820	G-7
*	R1821	G-7
	R1822	G-8
	R1823	G-7
	R1824	G-8
	R1831	G-8
*	R1835	H-8
*	R1836	H-8
*	R1838	G-7
	R1871	I-8
	R1873	H-8
	R1874	H-8
	R1875	H-7
	R1876	H-7
	R1878	I-7
	R1881	H-8
	R1882	G-8
	R1884	H-7
	R1885	H-8
	R1887	H-9
	R1888	I-7
	R1890	I-7
	R1891	H-8
	R1893	H-9
	R1894	K-8
	R1895	K-8
	R2001	G-8
	R2002	G-8
	R2003	F-8
	R2004	F-8
	R2005	G-8
	R2006	G-8
	R2007	F-7
	R2008	F-7
	R2009	G-8
	R2010	G-7
	R2013	F-7
	R2014	F-7
	R2015	F-7
	R2016	F-7
	R2017	F-7
	R2018	F-7
	R2035	I-13
	R2036	J-13
	R2037	J-13
*	R2201	F-6
	R2202	G-6
	R2205	G-6
	R2206	G-6
	R2207	F-6
	R2208	G-6
	R2209	G-6
	R2210	G-6
	R2211	G-6
	R2212	G-6
	R2213	F-6
	R2214	G-6
	R2215	G-6
	R2216	G-6
	R2217	G-6
	R2218	G-6
	R2219	G-6
	R2220	G-6
	R2221	G-6
	R2222	F-6
	R2223	G-6
	R2224	G-5
	R2225	G-5
	R2226	F-6
	R2227	G-6
	R2228	G-6
	R2229	F-6
	R2230	F-5
	R2231	F-6
	R2237	G-5
	R2238	G-5
	R2239	G-5
*	R2241	F-6
	R2242	F-6
*	R2243	G-6
	R2244	G-6
	R2246	F-5
	R2248	G-6
	R2501	E-5
	R2601	C-6
	R2801	F-4
	R2803	E-3
	R2804	F-3
	R2805	F-3
	R2806	E-3
	R2807	F-4
	R2808	E-4
	R2809	E-4
	R2812	E-4
	R2813	F-5
	R3001	F-8
	R3002	E-9
	R3003	F-9
	R3004	E-9
	R3005	E-8
	R3006	E-9
	R3007	E-9
	R3008	E-9
	R3013	F-9
	R3015	E-9
	R3018	E-8
	R3019	F-10
	R3020	F-9
	R3021	F-8
	R3022	F-8
	R3023	G-9
	R3201	B-5
	R3202	B-5
	R3203	B-5
	R3204	B-5
	R3205	B-5
	R3206	B-5
	R3207	B-5
	R3208	B-4
	R3209	B-5
	R3210	B-4
	R3211	B-5
	R3212	B-5
	R3213	B-5
	R3214	B-5
	R3215	B-5
	R3216	B-4
	R3217	B-4
	R3218	B-4
	R3219	C-4
	R3220	B-4
	R3221	C-4
	R3222	C-5
	R3223	C-4
	R3224	C-4
	R3225	C-4
	R3226	C-4
*	R3600	L-11
*	R3601	L-11
*	R3602	L-11
*	R3603	J-12
*	R3604	J-12
*	R3605	J-12
*	R3606	J-12
*	R3607	J-11
*	R3608	I-11
*	R3609	J-10
*	R3610	J-10
*	R3611	J-10
*	R3612	J-11
*	R3613	J-11
*	R3614	J-11
*	R3615	J-11
*	R3616	J-11
*	R3618	K-12
*	R3619	K-12
*	R3620	L-12
*	R3621	J-12
*	R3622	J-12
*	R3623	J-12
*	R3624	K-12
*	R3625	J-12
*	R3626	J-12
*	R3627	J-11
*	R3628	J-11
*	R3629	K-11
*	R3630	K-11
*	R3631	K-11
*	R3632	K-11
*	R3633	K-11
*	R3634	K-11
*	R3635	L-11
*	R3636	K-11
*	R3637	J-11
*	R3638	K-11
*	R3639	K-11
*	R3640	K-11
*	R3641	K-10
*	R3642	K-10
*	R3643	K-10
*	R3648	K-10
*	R3649	K-11
*	R3650	K-10
*	R3651	K-11
*	R3652	L-10
*	R3653	K-11
*	R3654	L-10
*	R3655	L-11
*	R3656	L-11
*	R3657	L-10
*	R3658	L-9
*	R3659	L-9
*	R3660	K-12
*	R3661	K-12
*	R3662	L-11
*	R3663	L-11
*	R3665	L-11
*	R3674	L-11
*	R3699	J-11
*	R3700	J-11
*	R3701	J-11
*	R3702	J-10
*	R3703	J-10
*	R3704	J-10
*	R3705	J-10
*	R3706	J-10
*	R3707	L-12
	R4001	H-4
	R4002	H-5
	R4003	H-5
	R4004	H-5
	R4005	H-5
	R4006	H-4
	R4011	H-4
	R4012	H-4
	R4013	H-3
	R4014	H-3
	R4015	H-3
	R4016	H-3
	R4017	I-3
	R4018	H-3
	R4019	H-3
	R4020	I-3
	R4022	H-3
	R4023	H-3
	R4024	H-3
	R4025	H-3
	R4026	I-3
	R4027	H-3
	R4028	H-3
	R4029	I-3
	R4031	I-4
	R4033	B-12
	R4035	J-5
	R4037	I-4
	R4041	J-4
	R4042	J-4
	R4043	I-4
	R4044	J-4
	R4045	I-4
	R4065	J-5
	R4066	J-5
	R4067	J-5
	R4068	J-5
	R4069	J-5
	R4070	I-5
	R4071	J-5
	R4072	J-5
	R4073	J-5
	R4074	K-5
	R4075	J-5
	R4076	J-5
	R4077	J-5
	R4078	J-5
	R4079	J-5
	R4080	J-5
	R4081	J-5
	R4082	J-5
	R4083	J-5
	R4086	J-4
	R4087	B-12
	R4096	H-5
	R4097	I-4
	R4098	I-4
	R4099	I-4
	R4104	H-5
	R4105	H-4
	R4110	J-5
	R4111	J-5
	R4113	I-4
	R4201	J-7
	R4202	I-5
	R4219	I-6
	R4246	J-7
	R4247	J-7
	R4248	K-7
	R4537	G-3
	R4540	G-3
	R4541	G-3
	R4552	H-4
	R4553	G-4
*	R4584	G-4
*	R4586	G-4
	R4601	H-3
	R4606	H-3
	R4607	H-3
	R4608	H-3
	R4609	H-3
	R4613	H-3
	R4614	H-3

4-3. PRINTED WIRING BOARDS

no mark : side A
* mark : side B

Ref.	Location
R4615	H-3
R4616	I-3
R4619	H-3
R4620	H-2
R4625	G-2
R4629	G-2
R4631	I-2
R4632	I-2
R4635	H-2
R4639	H-2
R4640	H-1
R4641	I-1
R4642	H-1
R4645	I-1
R4646	H-1
R4647	H-1
* R4648	F-12
* R4649	F-12
* R4650	F-12
* R4651	F-12
* R4657	F-11
* R4662	F-11
* R4664	F-11
R4676	I-1
R4681	H-3
R4687	H-3
* R4693	H-2
* R5006	A-8
* R5007	A-7
R5008	B-6
R5009	C-6
R5010	C-6
R5018	D-7
R5019	C-7
R5020	B-7
R5065	C-7
R5110	C-7
R5113	D-7
R5137	C-7
R5140	C-7
R5151	C-7
R5154	C-7
R5159	B-7
R5160	C-7
R5163	C-7
R5164	C-7
R5167	C-7
R5239	B-7
R5240	C-7
R5242	C-7
R5243	C-8
R5244	C-8
R5245	B-8
R5248	B-7
R5249	B-7
R5254	C-8
R5255	C-8
R5256	C-8
R5257	C-6
R5401	G-10
* R5402	E-11
R5403	G-10
R5404	G-10
R5405	E-12
R5406	E-12
R5407	E-12
R5408	E-12
* R5409	E-11
R5411	F-12
R5414	G-10
R5415	E-12
R5416	E-12
* R5417	E-11
R5418	H-11
R5419	H-11
R5420	H-11
R5421	G-11
R5422	H-11
R5423	H-11
R5426	E-11
R5427	F-12
R5428	F-12
R5429	F-12
R5433	C-8
R5436	C-8
R5438	C-8
* R5440	F-10
R5442	C-8
R5444	C-9
R5446	B-9
R5447	E-11
R5448	E-12
R5449	C-9
* R5450	E-11
R5453	C-9
R5454	C-9
R5455	E-11
R5456	C-9
R5459	F-12
R5460	B-9
R5461	B-9
R5462	F-12
R5463	B-8
R5465	F-12
R5468	E-11
R5469	C-9
R5470	F-12
R5471	C-8
R5472	C-9
R5473	C-9
R5474	C-10
R5475	C-10
R5477	C-10
R5478	C-9
R5479	C-9
R5480	B-10
R5481	C-9
R5482	C-10
R5483	C-10
R5484	B-9
R5485	C-10
R5486	C-9
R5487	C-9
R5488	B-10
R5489	C-10
R5490	C-10
R5491	C-9
R5494	I-12
R5495	H-12
R5496	H-12
* R5505	E-11
* R5508	E-11
* R5510	E-11
R5511	C-8
R6401	L-11
R6402	L-12
R6403	L-12
R6404	L-12
R6405	L-11
R6406	L-11
R6407	L-12
R6408	L-12
R6409	L-11
R6410	L-11
R6411	L-11
R6412	L-11
R6413	L-11
R6414	L-11
R6415	L-12
R6416	L-12
R6417	K-11
R6418	K-12
R6419	J-12
R6420	K-12
R6421	J-12
R6422	K-12
R6424	J-12
R6425	K-12
R6426	K-12
R6601	K-9
R6604	L-10
R6605	K-9
R6606	L-9
R6607	L-10
R6608	K-9
R6612	K-10
R6614	J-10
R6615	K-9
R6617	K-9
R6618	K-10
RB5000	C-7
RB5001	D-7
* S4602	L-5
* TP4001	H-4
X1871	I-8
X1872	I-7
X3201	B-4
X4601	I-2
X4602	H-1
X5000	B-6
X6401	K-11

MD-76 BOARD

Ref.	Location
C001	D-5
C002	E-6
CN001	K-1
CN002	I-1
CN003	C-11
D001	F-6
IC001	E-6
IC002	I-5
IC003	D-5
IC004	H-9
IC005	E-9
JR001	E-7
JR003	C-7
JR004	H-6
JR005	E-5
JR006	E-6
Q001	A-5
Q002	L-5
R001	B-12
R003	F-6
R004	E-6
R005	E-6
R006	E-6
R007	I-6
R008	E-6
R009	B-10
R010	D-6
R011	D-6
R012	D-6
R013	D-7
R014	J-7
R015	D-12
R028	I-6
R029	D-6
R030	F-6
R031	E-6
R032	B-9
R033	B-10
RV001	C-11
RV002	C-12
RV003	B-10
RV004	B-11
S001	B-9
S002	A-9
S003	A-8

FR-255 BOARD

Ref.	Location
C101	B-1
* C103	C-10
* C104	C-11
* CN101	D-9
* D101	D-10
* D102	D-10
* D103	C-10
D104	C-12
* D105	C-3
* D106	C-3
D107	D-2
D108	B-13
D109	B-5
D110	C-1
D111	B-9
D112	B-8
D113	C-5
D114	B-9
D115	B-7
D116	C-7
D117	B-4
D118	B-6
D119	C-8
D120	B-7
D121	C-9
D122	C-10
D123	B-1
D124	B-10
FB101	B-1
IC101	A-1
* IC102	C-11
* Q101	C-5
* Q102	C-1
* Q103	C-1
* Q104	C-10
* Q105	C-10
* R101	C-3
* R102	C-13
* R103	C-3
* R104	C-13
* R105	C-3
* R106	C-3
* R107	C-13
R108	D-10
* R109	C-13
* R111	C-3
* R112	C-3
R113	D-7
R114	D-9
* R115	C-13
* R117	C-5
R118	C-1
R119	C-1
R120	C-1
* R122	C-10
* R123	C-10
* R124	C-9
* R125	C-8
R126	C-5
* R127	C-9
* R128	C-7
R129	C-6
* R130	C-4
* R131	C-6
R132	C-8
* R133	C-6
R134	C-9
R135	C-10
* R140	D-1
* R141	C-6
* R142	D-1
* R143	C-6
* R146	C-10
S101	C-3
S102	C-3
S103	C-13
S104	C-14
S105	D-13
S106	D-10
S107	C-13
S109	D-8
S110	D-5
S111	C-13
S113	D-4
S114	D-9
S115	D-7
S116	A-13
S117	C-12
S118	D-1

4-3. PRINTED WIRING BOARDS

no mark : side A
* mark : side B

JU-002 BOARD

Ref.	Location
CN1000	C-2
CN1001	C-5
CN1002	C-8
D1006	B-6
D1009	B-5
D1010	B-3
D1011	B-2
D1012	B-2
FB1000	B-8
FB1001	B-9
FB1002	B-7
FB1003	B-9
J1000	A-7
J1001	A-2
R1014	C-7
R1015	B-7
R1034	B-8
R1035	B-8

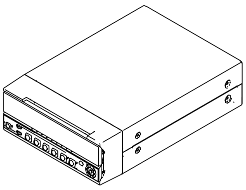
JL-002 BOARD

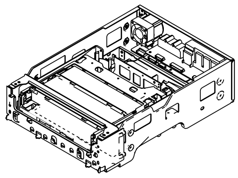
Ref.	Location
C743	A-7
C744	A-7
CN702	A-4
* CN721	B-5
CN722	A-5
* CN741	A-7
D701	A-2
D702	B-4
D703	B-4
D721	A-5
D741	B-7
D742	B-7
FB701	A-2
FB702	A-2
FB703	A-4
FB704	A-4
FB705	A-4
* J702	B-2
* J703	B-4
* J741	B-7
LF741	B-6
R701	A-4
RB001	B-5
* S701	B-3
TH721	A-6
TH722	A-6
TH723	A-5
TH724	A-5

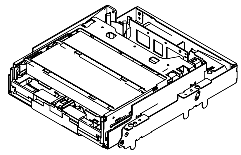
5. REPAIR PARTS LIST

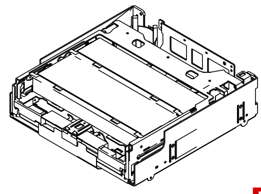
NOTE: Characters A to Z of the electrical parts list indicate location of exploded views in which the desired part is shown.

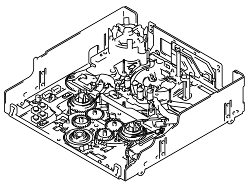
Link — EXPLODED VIEWS

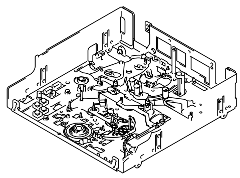

A
OVERALL ASSEMBLY

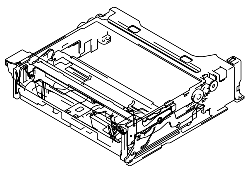

B
CHASSIS BLOCK


C
MD BLOCK


D
MECHANISM DECK ASSEMBLY-1


E
MECHANISM DECK ASSEMBLY-2


F
MECHANISM DECK ASSEMBLY-3


G
MECHANISM DECK ASSEMBLY-4

Link — ELECTRICAL PARTS LIST

ACCESSORIES

FP-104 FLEXIBLE BOARD D	JL-002 BOARD B	RP-243 BOARD C
FP-248 FLEXIBLE BOARD F	JU-002 BOARD B	VD-036 BOARD C
FR-255 BOARD A	MD-76 BOARD F	

5. REPAIR PARTS LIST

(ENGLISH)

NOTE:
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- CAPACITORS:
  uF: μF
- COILS
  uH: μH
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

- Color Indication of Appearance Parts
  Example:
  (SILVER) : Cabinet's Color
  (Silver) : Parts Color

(JAPANESE)

【使用上の注意】
- ここに記載されている部品は，補修用部品であるため，回路図及びセットに付いている部品と異なる場合があります。
- −XX，−Xは標準化部品のため，セットに付いている部品と異なる場合があります。
- *印の部品は常備在庫しておりません。
- コンデンサの単位でuFはμFを示します。
- 抵抗の単位Ωは省略してあります。
  金　　被：金属被膜抵抗。
  サンキン：酸化金属被膜抵抗。
- インダクタの単位でuHはμHを示します。
- 半導体の名称でuA..., uPA..., uPB..., uPC..., uPD...等はそれぞれμA..., μPA..., μPB..., μPC..., μPD...を示します。

お願い
図面番号で部品を指定するときは基板名又はブロックを併せて指定してください。

⚠印の部品，または⚠印付の点線で囲まれた部品は，安全性を維持するために，重要な部品です。
従って交換時は，必ず指定の部品を使用してください。

- 外装部品色表示
  例：
  (SILVER):セットの色を表す。
  (Silver) ：部品の色を表す。

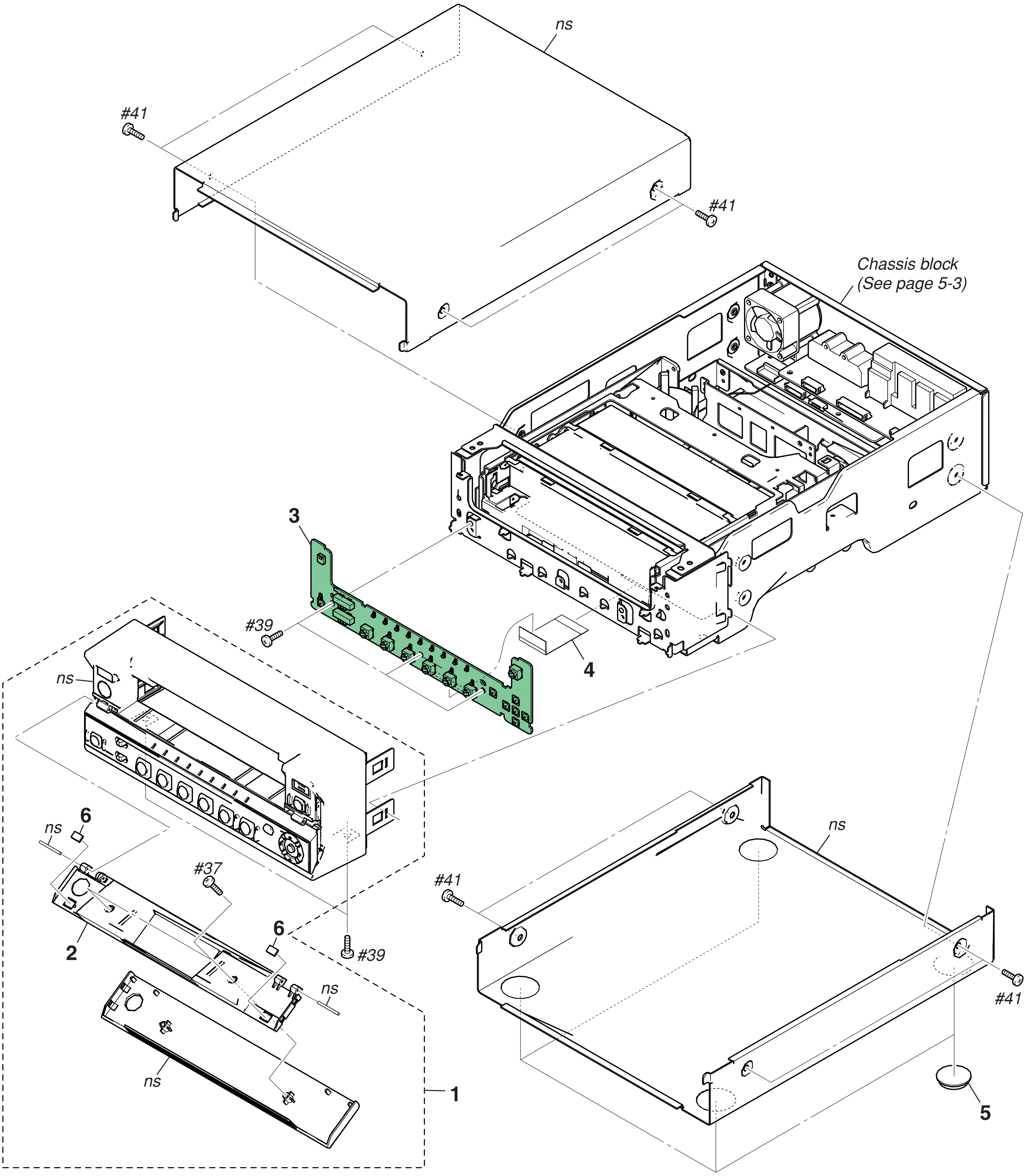
- Abbreviation
  AR : Argentine model
  AUS : Australian model
  BR : Brazilian model
  CH : Chinese model
  CND : Canadian model
  EE : East European model
  HK : Hong Kong model
  J : Japanese model
  JE : Tourist model
  KR : Korea model
  NE : North European model

DISASSEMBLY HARDWARE LIST

5-1. EXPLODED VIEWS

5-1-1. OVERALL ASSEMBLY

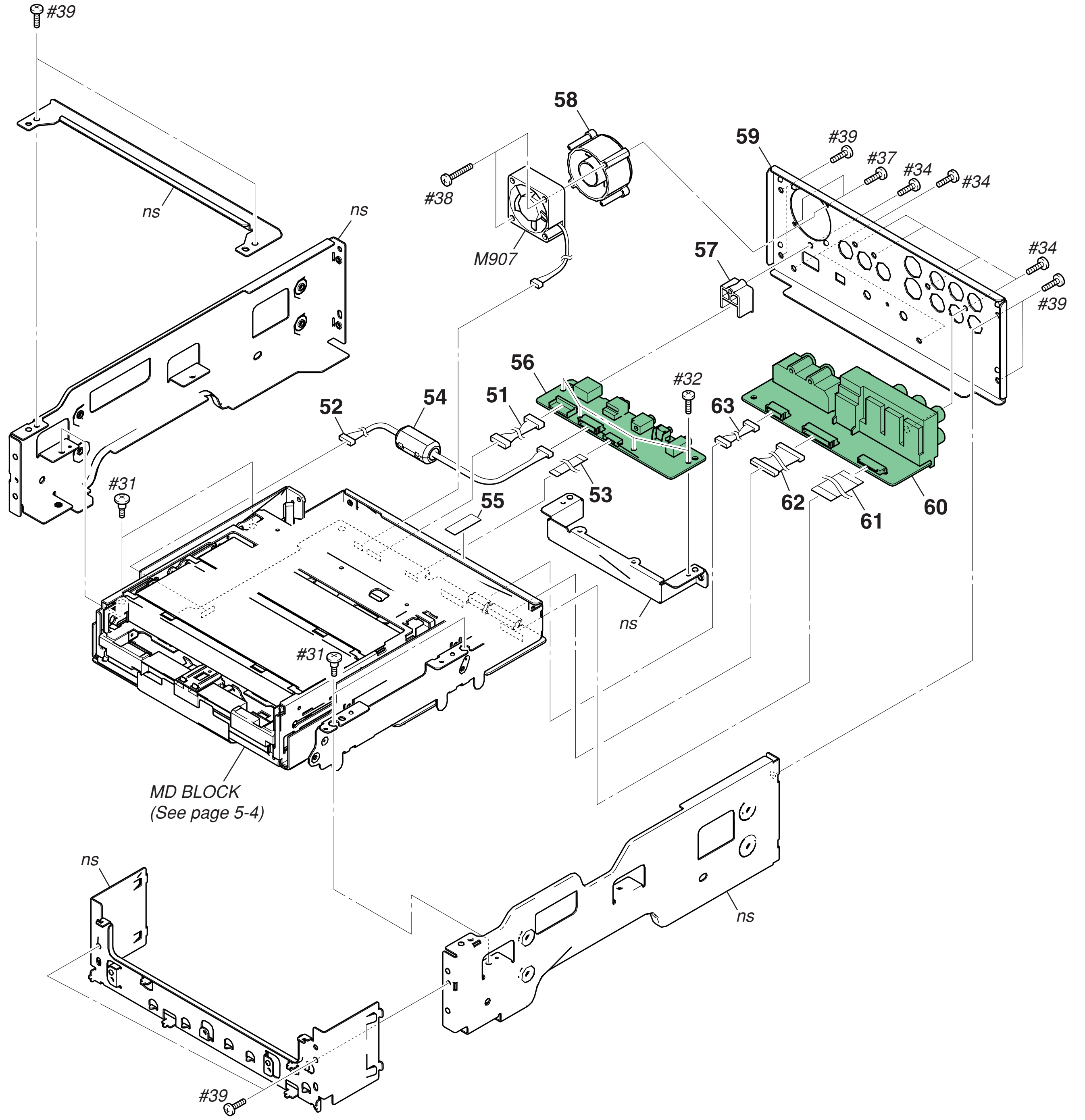
ns: not supplied



Ref. No.	Part No.	Description
1	X-2103-341-1	PANEL ASSY (4160), FRONT
2	X-2103-343-1	DOOR ASSY, FRONT
3	A-1166-895-A	FR-255 BOARD, COMPLETE
4	1-832-959-11	CABLE, FLEXIBLE FLAT (FFR-001)
* 5	3-066-177-01	FOOT, RUBBER
6	3-736-779-71	MAGNET
#37	3-080-206-31	SCREW, TAPPING, P2 (Black)
#39	7-685-791-09	SCREW +PTT 2.6X5 (S) (Black)
#41	3-065-748-01	SCREW, FLAT HEAD (Silver)

5-1-2. CHASSIS BLOCK

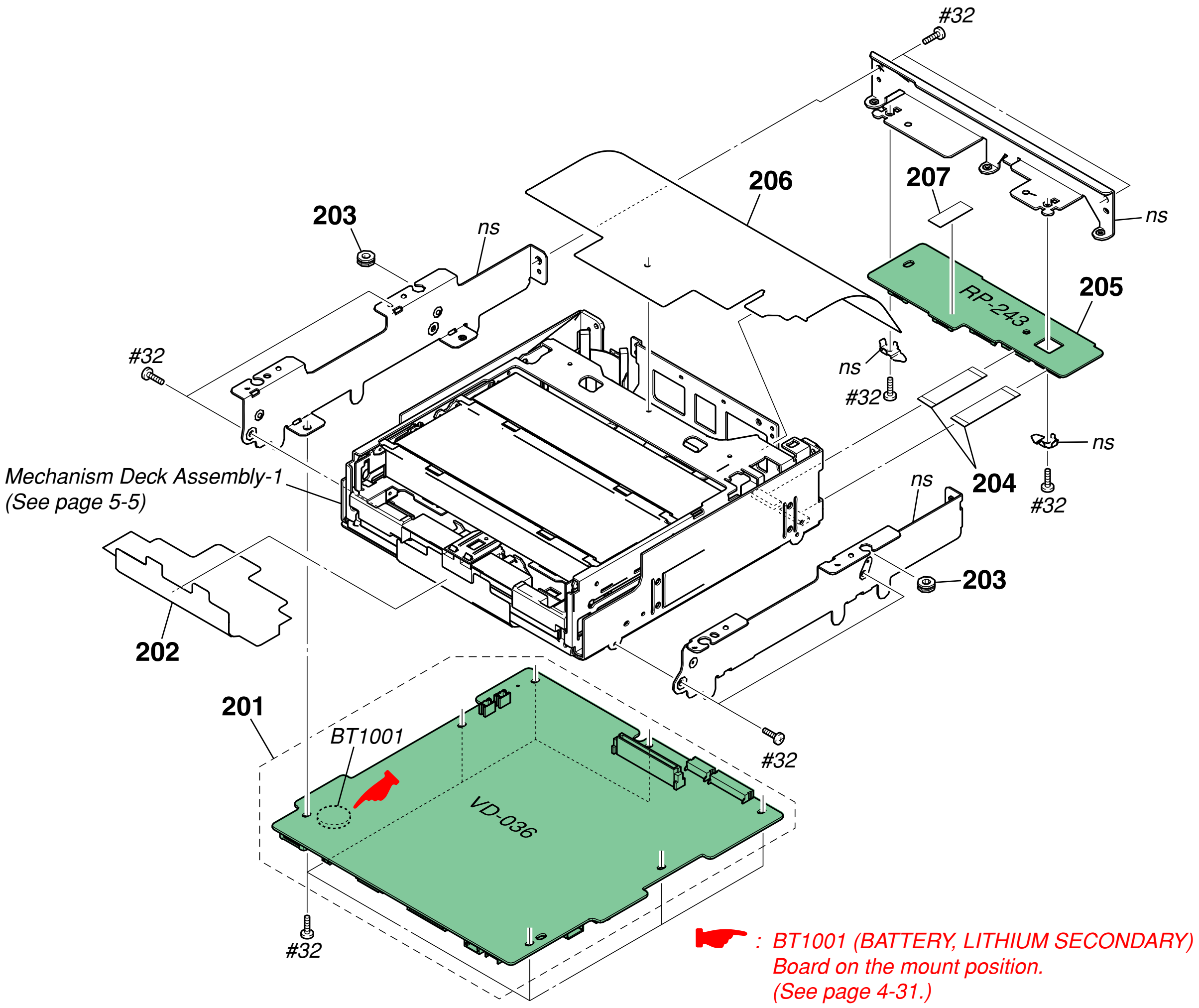
ns: not supplied



Ref. No.	Part No.	Description
51	1-964-813-11	HARNESS (PW-065)
52	1-964-812-11	HARNESS (DV-068)
53	1-832-962-11	CABLE, FLEXIBLE FLAT (FJK-001)
54	1-543-793-11	FILTER, CLAMP (FERRITE CORE)
55	3-941-343-01	TAPE (A)
56	A-1166-898-A	JL-002 BOARD, COMPLETE
57	2-676-028-01	HOLDER, JACK
58	2-676-029-01	HOLDER, FAN
59	2-660-370-01	PANEL, REAR
60	A-1166-897-A	JU-002 BOARD, COMPLETE
61	1-832-963-11	CABLE, FLEXIBLE FLAT (FJV-003)
62	1-964-815-11	HARNESS (SV-002)
63	1-964-816-11	HARNESS (CP-098)
M907	1-787-505-11	MOTOR, FAN
#31	2-102-434-01	SCREW (M3 (ECO)), STEP (Silver)
#32	2-102-498-01	SCREW (2 (G TO)) (ECO) (Silver)
#34	3-077-331-41	+BV3 (3-CR) (Black)
#37	3-080-206-31	SCREW, TAPPING, P2 (Black)
#38	7-685-651-79	SCREW, TAPPING, +BV 3X20, TYPE 2, IT-3 (Silver)
#39	7-685-791-09	SCREW +PTT 2.6X5 (S) (Black)

5-1-3. MD BLOCK

ns: not supplied



CAUTION
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

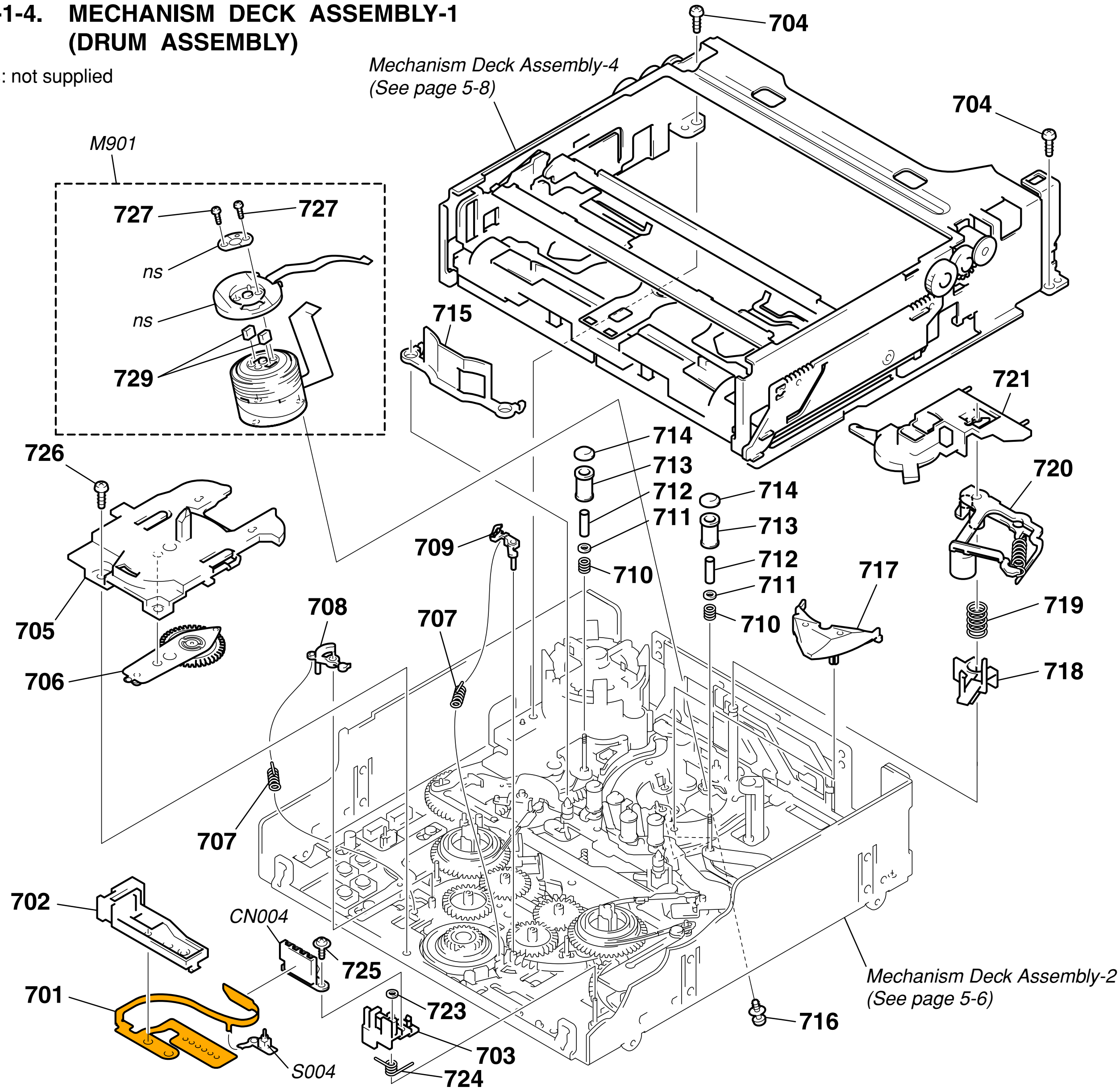
注意
電池の交換は，正しく行わないと破裂する恐れがあります。電池を交換する場合には必ず同じ型名の電池又は同等品と交換してください。

• Refer to page 5-1 for mark ⚠.

Ref. No.	Part No.	Description
201	A-1179-556-A	VD-036 BOARD, COMPLETE (SERVICE)
202	2-679-684-01	SHEET MD
203	3-974-011-01	RUBBER, VIBRATION PROOF
204	1-832-958-11	CABLE, FLEXIBLE FLAT (FRP-001)
205	A-1166-862-A	RP-243 BOARD, COMPLETE
* 206	2-698-077-01	SHEET (DEW BARRIER)
207	3-941-343-01	TAPE (A)
⚠BT1001	1-756-128-11	BATTERY, LITHIUM (SECONDARY)
#32	2-102-498-01	SCREW (2 (G TO)) (ECO) (Silver)

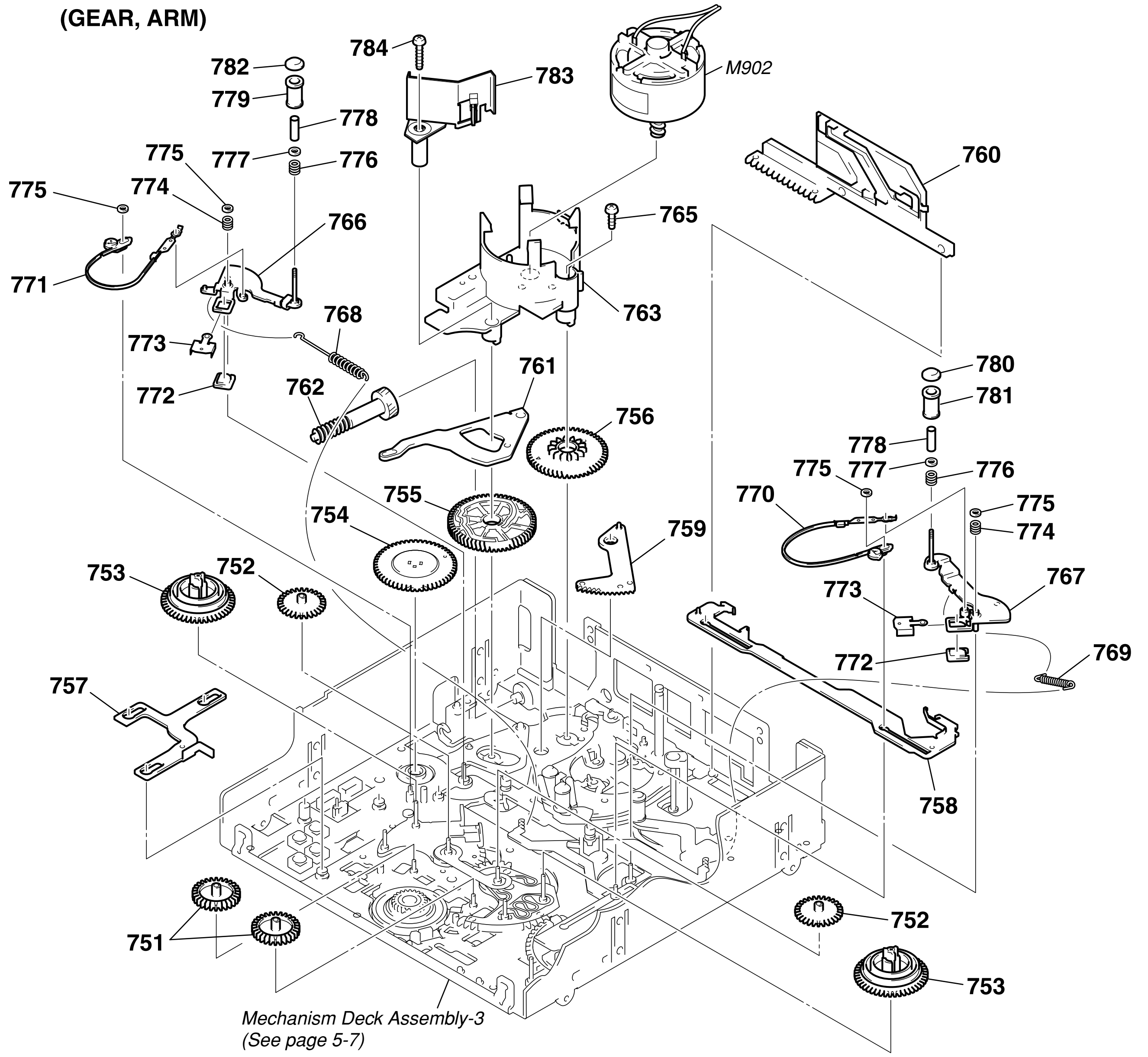
5-1-4. MECHANISM DECK ASSEMBLY-1 (DRUM ASSEMBLY)

ns: not supplied



Ref. No.	Part No.	Description
701	1-675-561-11	FP-104 FLEXIBLE BOARD
* 702	3-057-351-01	GUIDE, MIC BASE
703	3-057-350-02	BASE, MIC
704	3-732-817-11	SCREW (2X4.5), TAPPING
705	3-057-319-05	RETAINER, PENDULUM
706	X-3949-922-1	ARM ASSY, PENDULUM
707	3-057-286-01	SPRING, EXTENSION (BRAKE)
708	3-057-280-01	ARM (S), BRAKE
709	3-057-279-01	BRAKE (T), RATCHET
710	3-057-232-01	SPRING, COMPRESSION (TG)
711	3-057-238-01	RING, TG
712	3-057-237-01	SLEEVE, TG
713	3-057-235-01	ROLLER, TG
714	3-057-234-01	FLANGE, TG UPPER
715	3-057-379-01	GUARD, GUIDE
716	A-7094-608-C	SCREW ASSY, DRUM FITTING
717	3-973-171-01	SUPPORT, TAPE
718	3-057-227-01	RETAINER, TAPE
719	3-973-818-01	SPRING, COMPRESSION (TAPE RETAINER)
720	X-3949-915-1	ARM ASSY, PINCH
721	3-057-228-01	CAP, DRUM
723	3-726-829-01	WASHER, STOPPER
724	3-057-353-01	SPRING, MIC BASE
725	3-318-201-91	SCREW (B) (1.4X3), TAPPING
726	3-973-266-11	SCREW (M2X2.2 (MEK)), HEAD
727	3-703-816-74	SCREW (M1.4X4.5)
729	1-770-363-11	CONNECTOR, ELASTIC
CN004	1-770-312-21	CONNECTOR 4P
M901	A-1193-393-A	DRUM ASSY (DEH-21D/J-RP) (SERVICE)
S004	1-762-351-22	SWITCH, PUSH (1 KEY) (REC PROOF)

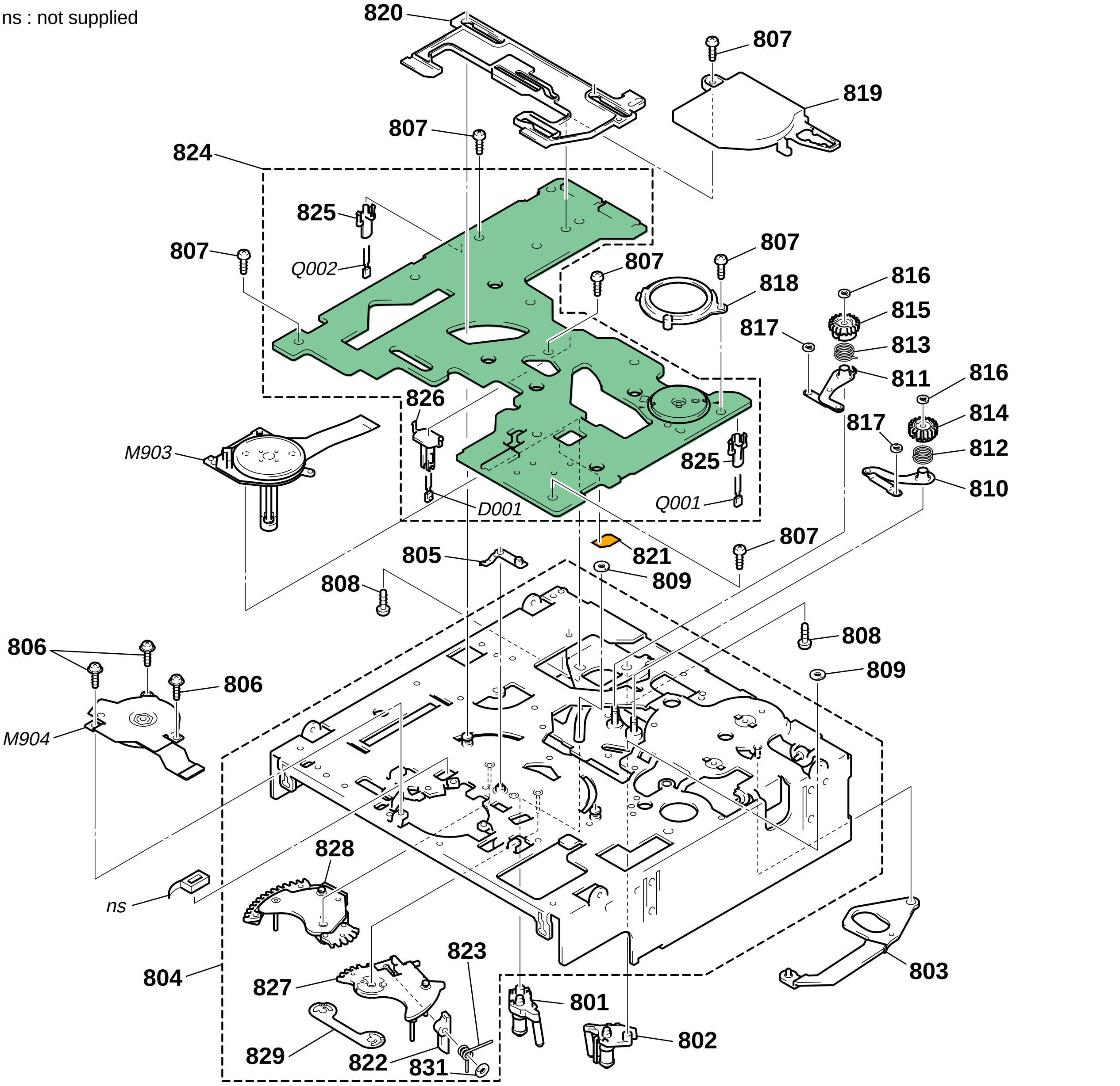
5-1-5. MECHANISM DECK ASSEMBLY-2 (GEAR, ARM)



Ref. No.	Part No.	Description
751	A-7096-800-A	GEAR (A) ASSY, IDLER
752	3-057-311-01	GEAR (B), IDLER
753	A-7094-599-A	REEL (LARGE) BLOCK ASSY
754	3-057-267-01	GEAR, ENCODER
755	3-057-294-01	GEAR, MAIN CAM
756	3-973-140-01	GEAR, SUB CAM
* 757	3-057-302-01	SLIDER, SBR
758	3-057-314-02	SLIDER, SUB
759	X-3950-816-2	ARM ASSY, LOADING
760	3-057-221-01	SLIDER, PINCH
* 761	3-057-252-01	ARM, SUB SLIDER
762	3-973-159-01	GEAR, JOINT
763	3-057-222-02	HOLDER, MOTOR
765	3-973-266-11	SCREW (M2X2.2 (MEK)), HEAD
766	X-3949-918-1	ARM ASSY, TG2
767	X-3949-919-1	ARM ASSY, TG7
768	3-057-295-01	SPRING, EXTENSION (TG2)
769	3-057-296-02	SPRING, EXTENSION (TG7)
770	X-3949-921-1	BAND (TG7) ASSY
771	X-3949-920-1	BAND (TG2) ASSY
772	3-057-281-01	MAGNET, ET
773	3-057-336-01	HOLDER, MAGNET
774	3-057-344-01	SPRING, COMPRESSION (TG ARM)
775	3-726-829-01	WASHER, STOPPER
776	3-057-232-01	SPRING, COMPRESSION (TG)
777	3-057-238-01	RING, TG
778	3-057-237-01	SLEEVE, TG
779	3-057-235-01	ROLLER, TG
780	3-057-234-01	FLANGE, TG UPPER
781	3-057-337-01	ROLLER, TG7
782	3-063-887-01	FLANGE (2), TG UPPER
783	X-2148-017-1	TC ASSY
784	2-685-919-01	SCREW (M2X13)
M902	X-3946-702-1	MOTOR ASSY, CAM

5-1-6. MECHANISM DECK ASSEMBLY-3 (MOTOR, DECK BOARD)

ns : not supplied



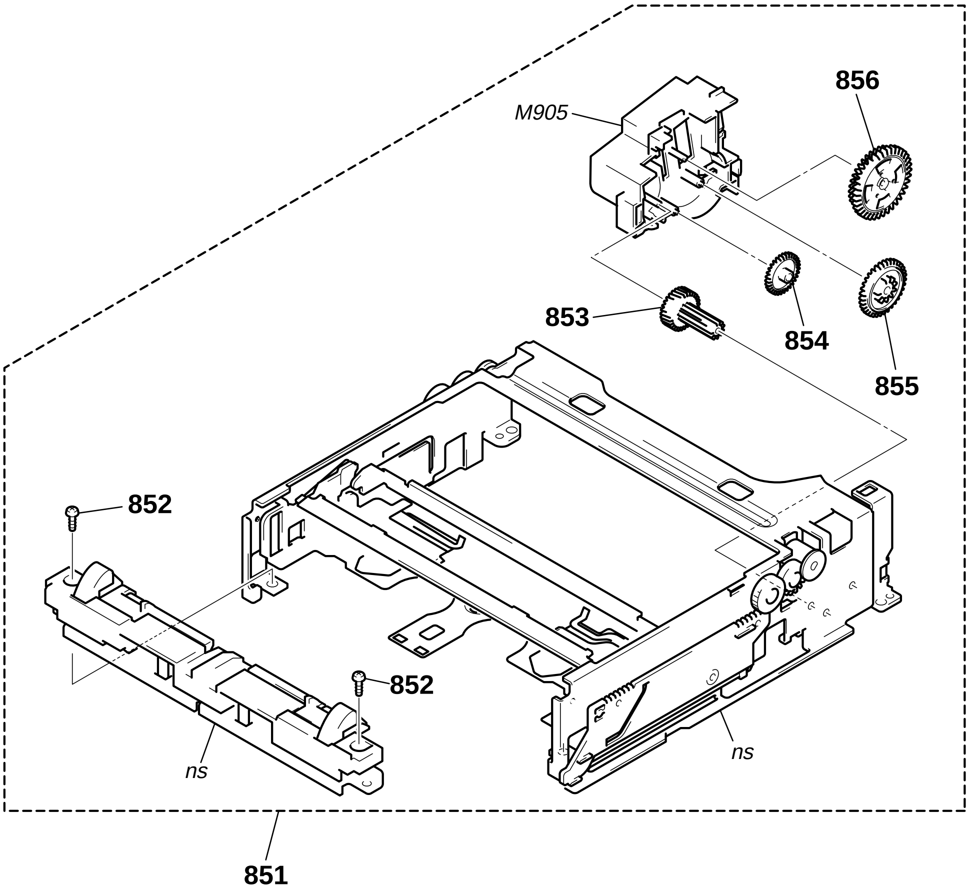
Ref. No.	Part No.	Description
801	A-7025-007-A	COASTER (T) BLOCK ASSY
802	A-7096-267-A	COASTER (S) BLOCK ASSY (R)
* 803	3-057-283-02	ARM, MAIN SLIDER
804	X-2022-253-1	CHASSIS ASSY, MECHANICAL
805	X-3949-924-1	STOPPER ASSY, PENDULUM
806	3-947-503-21	SCREW (M1.4)
807	3-732-817-11	SCREW (2X4.5), TAPPING
808	3-973-266-11	SCREW (M2X2.2 (MEK)), HEAD
809	3-973-142-01	STOPPER, COASTER PUNCHING
810	X-3946-690-2	ARM (S) ASSY, GL
811	X-3946-689-2	ARM (T) ASSY, GL
812	3-973-146-02	SPRING (S), GL TORSION
813	3-973-156-02	SPRING (T), GL TORSION
814	3-973-264-01	GEAR (S), GL
815	3-973-138-01	GEAR (T), GL
816	3-727-176-01	WASHER, STOPPER
817	3-973-143-01	WASHER, COASTER STOPPER
818	3-057-339-01	COVER, ENCODER
819	3-057-340-01	COVER, CAPSTAN

Ref. No.	Part No.	Description
820	3-057-282-01	SLIDER, MAIN
821	1-657-785-11	FP-248 FLEXIBLE BOARD (DEW SENSOR)
822	3-057-320-01	BLOCK, REEL LOCK RELEASE
823	3-057-354-01	SPRING, REEL LOCK RELEASE
824	A-1154-723-A	MD-76 BOARD, COMPLETE
* 825	3-066-170-01	HOLDER (A), SENSOR
* 826	3-057-555-01	HOLDER, LED
827	X-3950-199-1	BASE (S) ASSY, REEL (SERVICE)
828	X-3950-200-1	BASE (T) ASSY, REEL (SERVICE)
829	3-057-265-01	RETAINER, REEL BASE
831	3-726-829-01	WASHER, STOPPER
D001	6-500-652-01	DIODE GL453SE0000F (TAPE LED)
M903	8-835-648-13	MOTOR, DC SCD17A/C-NP (CAPSTAN)
M904	X-3949-928-1	MOTOR ASSY, REEL
Q001	6-550-402-01	TRANISTOR PT4850FE000F (TAPE END SENSOR)
Q002	6-550-402-01	TRANISTOR PT4850FE000F (TAPE TOP SENSOR)

5. REPAIR PARTS LIST

5-1-7. MECHANISM DECK ASSEMBLY-4 (CASSETTE COMPARTMENT)

ns : not supplied



Ref. No.	Part No.	Description
851	A-1183-162-F	COMPARTMENT BLOCK ASSY
852	3-732-817-11	SCREW (2X4.5), TAPPING
853	3-057-253-01	GEAR, WHEEL
854	3-057-254-01	GEAR (A)
855	3-057-255-01	GEAR (B)
856	A-7094-689-A	GEAR (CD) BLOCK ASSY (SERVICE)
M905	X-3949-925-4	MOTOR ASSY, FL

5-2. ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description			
	1-675-561-11	FP-104 FLEXIBLE BOARD			
		********************			
		(CN004 and S004 are not included in FP-104 flexible board.)			
		< CONNECTOR >			
CN004	1-770-312-21	CONNECTOR 4P			
		< SWITCH >			
S004	1-762-351-22	SWITCH, PUSH (1 KEY) (REC PROOF)			

Ref. No.	Part No.	Description			
	1-657-785-11	FP-248 FLEXIBLE BOARD (DEW SENSOR)			
		********************			

Ref. No.	Part No.	Description			
	A-1166-895-A	FR-255 BOARD, COMPLETE			
		**********************			
		< CAPACITOR >			
C101	1-135-856-91	TANTAL. CHIP	100uF	20%	10V
C103	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C104	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
		< CONNECTOR >			
CN101	1-770-542-51	CONNECTOR, FFC/FPC 40P			
		< DIODE >			
D101	8-719-056-85	DIODE UDZ-TE-17-8.2B			
D102	8-719-056-85	DIODE UDZ-TE-17-8.2B			
D103	8-719-056-85	DIODE UDZ-TE-17-8.2B			
D104	8-719-056-85	DIODE UDZ-TE-17-8.2B			
D105	8-719-056-85	DIODE UDZ-TE-17-8.2B			
D106	8-719-056-85	DIODE UDZ-TE-17-8.2B			
D107	8-719-056-85	DIODE UDZ-TE-17-8.2B			
D108	8-719-056-85	DIODE UDZ-TE-17-8.2B			
D109	6-500-252-01	DIODE SML-512WWT86 (▭ (CASSETTE))			
D110	6-500-781-01	DIODE SML-521MUW (⏻ ON/STANDBY)			
D111	6-500-252-01	DIODE SML-512WWT86 (DVCAM-i.LINK)			
D112	6-500-252-01	DIODE SML-512WWT86 (50)			
D113	6-500-252-01	DIODE SML-512WWT86 (REW ◀◀)			
D114	6-500-252-01	DIODE SML-512WWT86 (HDV-i.LINK)			
D115	6-500-252-01	DIODE SML-512WWT86 (60)			
D116	6-501-030-01	DIODE SML-412MWT86 (PLAY ▶)			
D117	6-500-817-01	DIODE (LED) SML-512UWT86 (CAUTION)			
D118	6-500-252-01	DIODE SML-512WWT86 (HDV)			
D119	6-500-252-01	DIODE SML-512WWT86 (FF ▶▶)			
D120	6-500-252-01	DIODE SML-512WWT86 (DVCAM)			
D121	6-500-252-01	DIODE SML-512WWT86 (PAUSE ❚❚)			
D122	6-500-817-01	DIODE (LED) SML-512UWT86 (REC ●)			
D123	8-719-056-85	DIODE UDZ-TE-17-8.2B			
D124	6-500-252-01	DIODE SML-512WWT86 (DV-i.LINK)			
		< FERRITE BEAD >			
FB101	1-400-331-11	FERRITE, EMI (SMD) (1005)			
		< IC >			
IC101	8-742-430-00	HYB IC SBX3055-09			
IC102	6-703-381-01	IC PST3523UL			
		< TRANSISTOR >			
Q101	8-729-048-50	TRANSISTOR	2SK3018-T106		
Q102	8-729-048-50	TRANSISTOR	2SK3018-T106		
Q103	8-729-037-74	TRANSISTOR	UN9213J-(TX).SO		
Q104	8-729-041-23	TRANSISTOR	NDS356AP		
Q105	6-550-119-01	TRANSISTOR	DTC144EMT2L		
		< RESISTOR >			
R101	1-218-970-11	RES-CHIP	27K	5%	1/16W
R102	1-218-964-11	RES-CHIP	8.2K	5%	1/16W
R103	1-218-970-11	RES-CHIP	27K	5%	1/16W
R104	1-218-960-11	RES-CHIP	3.9K	5%	1/16W
R105	1-218-967-11	RES-CHIP	15K	5%	1/16W
R106	1-218-967-11	RES-CHIP	15K	5%	1/16W
R107	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R108	1-218-955-11	RES-CHIP	1.5K	5%	1/16W
R109	1-218-955-11	RES-CHIP	1.5K	5%	1/16W
R111	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R112	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R113	1-218-954-11	RES-CHIP	1.2K	5%	1/16W
R114	1-218-954-11	RES-CHIP	1.2K	5%	1/16W
R115	1-218-954-11	RES-CHIP	1.2K	5%	1/16W
R117	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R118	1-218-955-11	RES-CHIP	1.5K	5%	1/16W
R119	1-218-944-11	RES-CHIP	180	5%	1/16W
R120	1-218-937-11	RES-CHIP	47	5%	1/16W
R122	1-218-973-11	RES-CHIP	47K	5%	1/16W
R123	1-218-953-11	RES-CHIP	1K	5%	1/16W
R124	1-218-950-11	RES-CHIP	560	5%	1/16W
R125	1-218-950-11	RES-CHIP	560	5%	1/16W
R126	1-218-950-11	RES-CHIP	560	5%	1/16W
R127	1-218-950-11	RES-CHIP	560	5%	1/16W
R128	1-218-950-11	RES-CHIP	560	5%	1/16W
R129	1-218-944-11	RES-CHIP	180	5%	1/16W
R130	1-218-953-11	RES-CHIP	1K	5%	1/16W
R131	1-218-950-11	RES-CHIP	560	5%	1/16W
R132	1-218-950-11	RES-CHIP	560	5%	1/16W
R133	1-218-950-11	RES-CHIP	560	5%	1/16W
R134	1-218-950-11	RES-CHIP	560	5%	1/16W
R135	1-218-953-11	RES-CHIP	1K	5%	1/16W
R140	1-218-929-11	RES-CHIP	10	5%	1/16W
R141	1-218-929-11	RES-CHIP	10	5%	1/16W
R142	1-218-989-11	RES-CHIP	1M	5%	1/16W
R143	1-218-989-11	RES-CHIP	1M	5%	1/16W
R146	1-218-950-11	RES-CHIP	560	5%	1/16W
		< SWITCH >			
S101	1-572-342-11	SWITCH, SLIDE (INPUT SELECT)			
S102	1-572-342-11	SWITCH, SLIDE (DISPLAY OUTPUT)			
S103	1-786-157-11	SWITCH, TACTILE (⇦)			
S104	1-786-157-11	SWITCH, TACTILE (⇨)			
S105	1-786-157-11	SWITCH, TACTILE (⇩)			

Ref. No.	Part No.	Description
S106	1-771-428-12	SWITCH, TACTILE (REC ●)
S107	1-786-157-11	SWITCH, TACTILE (⇧)
S109	1-771-428-12	SWITCH, TACTILE (FF ▶▶)
S110	1-771-428-12	SWITCH, TACTILE (REW ◀◀)
S111	1-786-157-11	SWITCH, TACTILE (EXEC)
S113	1-771-428-12	SWITCH, TACTILE (STOP ■)
S114	1-771-428-12	SWITCH, TACTILE (PAUSE ❚❚)
S115	1-771-428-12	SWITCH, TACTILE (PLAY ▶)
S116	1-771-428-12	SWITCH, TACTILE (EJECT ⏏)
S117	1-786-157-11	SWITCH, TACTILE (MENU)
S118	1-786-157-11	SWITCH, TACTILE (⏻ ON/STANDBY)

Ref. No.	Part No.	Description
	A-1166-898-A	JL-002 BOARD, COMPLETE
		**********************
		< CAPACITOR >
C743	1-127-715-91	CERAMIC CHIP 0.22uF 10% 16V
C744	1-127-715-91	CERAMIC CHIP 0.22uF 10% 16V
		< CONNECTOR >
* CN702	1-691-374-51	CONNECTOR, FFC/FPC 10P
CN721	1-785-806-12	CONNECTOR, SQUARE TYPE (INDI) 4P (HDV/DV)
CN722	1-580-756-21	PIN, CONNECTOR (SMD) 7P
CN741	1-506-485-11	PIN, CONNECTOR 6P
		< DIODE >
D701	8-719-067-59	DIODE MAZ9120D0LS0-TX/L
D702	8-719-067-59	DIODE MAZ9120D0LS0-TX/L
D703	8-719-067-59	DIODE MAZ9120D0LS0-TX/L
D721	6-500-750-01	DIODE NSAD500H-T1-A
D741	8-719-056-59	DIODE MAZS120008SO
D742	8-719-056-59	DIODE MAZS120008SO
		< FERRITE BEAD >
FB701	1-500-245-22	BEAD, FERRITE (CHIP) (2012)
FB702	1-500-245-22	BEAD, FERRITE (CHIP) (2012)
FB703	1-500-245-22	BEAD, FERRITE (CHIP) (2012)
FB704	1-500-245-22	BEAD, FERRITE (CHIP) (2012)
FB705	1-500-245-22	BEAD, FERRITE (CHIP) (2012)
		< JACK >
J702	1-691-737-21	JACK (SMALL TYPE) (CONTROL S)
J703	1-565-276-31	JACK, ULTRA SMALL 1P (LANC)
J741	1-817-361-11	DC-IN CONNECTOR (DC IN)
		< LINE FILTER >
LF741	1-424-361-11	INDUCTOR 40uH
		< RESISTOR >
R701	1-216-001-00	RES-CHIP 10 5% 1/10W
		< COMPOSITION CIRCUIT BLOCK >
RB001	1-234-400-21	CONDUCTOR, NETWORK (2010X4)

Ref. No.	Part No.	Description
		< SWITCH >
S701	1-571-914-21	SWITCH, KEY BOARD (RESET)
		< THERMISTOR >
TH721	1-805-726-11	THERMISTOR, POSITIVE
TH722	1-805-726-11	THERMISTOR, POSITIVE
TH723	1-805-726-11	THERMISTOR, POSITIVE
TH724	1-805-726-11	THERMISTOR, POSITIVE

Ref. No.	Part No.	Description
	A-1166-897-A	JU-002 BOARD, COMPLETE
		**********************
		< CONNECTOR >
* CN1000	1-580-789-22	PIN, CONNECTOR (SMD) 6P
* CN1001	1-764-007-11	PIN, CONNECTOR (SMD) 12P
* CN1002	1-565-771-71	CONNECTOR, FPC 12P
		< DIODE >
D1006	6-500-562-01	DIODE NSAD500S-T1
D1009	6-500-562-01	DIODE NSAD500S-T1
D1010	6-500-562-01	DIODE NSAD500S-T1
D1011	6-500-562-01	DIODE NSAD500S-T1
D1012	6-500-562-01	DIODE NSAD500S-T1
		< FERRITE BEAD >
FB1000	1-500-245-22	BEAD, FERRITE (CHIP) (2012)
FB1001	1-500-245-22	BEAD, FERRITE (CHIP) (2012)
FB1002	1-500-245-22	BEAD, FERRITE (CHIP) (2012)
FB1003	1-500-245-22	BEAD, FERRITE (CHIP) (2012)
		< JACK >
* J1000	1-817-185-11	JACK BLOCK, PIN 8P (S VIDEO/VIDEO/AUDIO)
J1001	1-819-100-11	JACK, PIN 3P (COMPONENT OUT)
		< RESISTOR >
R1014	1-216-864-11	SHORT CHIP 0
R1015	1-216-864-11	SHORT CHIP 0
R1034	1-216-857-11	METAL CHIP 1M 5% 1/10W
R1035	1-216-857-11	METAL CHIP 1M 5% 1/10W

Ref. No.	Part No.	Description
	A-1154-723-A	MD-76 BOARD, COMPLETE
		**********************
*	3-057-555-01	HOLDER, LED
*	3-066-170-01	HOLDER (A), SENSOR
	3-973-185-01	ENCODER
		< CAPACITOR >
C001	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V
C002	1-104-851-11	TANTAL. CHIP 10uF 20% 10V
		< CONNECTOR >
CN001	1-691-359-51	CONNECTOR, FFC/FPC (ZIF) 21P
CN002	1-691-359-51	CONNECTOR, FFC/FPC (ZIF) 21P
CN003	1-691-356-51	CONNECTOR, FFC/FPC (ZIF) 18P

Ref. No.	Part No.	Description			
		< DIODE >			
D001	6-500-652-01	DIODE GL453SE0000F (TAPE LED)			
		< IC >			
IC001	8-759-510-71	IC BA10358F-E2			
IC002	8-719-052-03	ELEMENT, HOLE THS124TE85L			
IC003	8-719-052-03	ELEMENT, HOLE THS124TE85L			
IC004	8-719-082-56	PHOTO COUPLER TLP907 (LB, SONY)			
IC005	8-719-082-56	PHOTO COUPLER TLP907 (LB, SONY)			
		< JUMPER RESISTOR >			
JR001	1-216-296-11	SHORT CHIP	0		
JR003	1-216-296-11	SHORT CHIP	0		
JR004	1-216-296-11	SHORT CHIP	0		
JR005	1-216-296-11	SHORT CHIP	0		
JR006	1-216-864-11	SHORT CHIP	0		
		< TRANSISTOR >			
Q001	6-550-402-01	TRANSISTOR	PT4850FE000F (TAPE END SENSOR)		
Q002	6-550-402-01	TRANSISTOR	PT4850FE000F (TAPE TOP SENSOR)		
		< RESISTOR >			
R001	1-216-814-11	METAL CHIP	270	5%	1/10W
R003	1-216-810-11	METAL CHIP	120	5%	1/10W
R004	1-216-837-11	METAL CHIP	22K	5%	1/10W
R005	1-218-867-11	METAL CHIP	6.8K	0.5%	1/10W
R006	1-218-867-11	METAL CHIP	6.8K	0.5%	1/10W
R007	1-216-809-11	METAL CHIP	100	5%	1/10W
R008	1-216-837-11	METAL CHIP	22K	5%	1/10W
R009	1-216-837-11	METAL CHIP	22K	5%	1/10W
R010	1-218-867-11	METAL CHIP	6.8K	0.5%	1/10W
R011	1-218-867-11	METAL CHIP	6.8K	0.5%	1/10W
R012	1-216-174-00	RES-CHIP	100	5%	1/8W
R013	1-216-837-11	METAL CHIP	22K	5%	1/10W
R014	1-216-184-00	RES-CHIP	270	5%	1/8W
R015	1-216-814-11	METAL CHIP	270	5%	1/10W
R028	1-216-809-11	METAL CHIP	100	5%	1/10W
R029	1-216-809-11	METAL CHIP	100	5%	1/10W
R030	1-216-864-11	SHORT CHIP	0		
R031	1-216-864-11	SHORT CHIP	0		
R032	1-216-864-11	SHORT CHIP	0		
R033	1-216-864-11	SHORT CHIP	0		
		< VARIABLE RESISTOR >			
RV001	1-241-770-11	RES, ADJ CERMET		1M (GAIN)	
RV002	1-238-019-11	RES, ADJ CERMET		47K (OFFSET)	
RV003	1-241-770-11	RES, ADJ CERMET		1M (GAIN)	
RV004	1-238-019-11	RES, ADJ CERMET		47K (OFFSET)	
		< SWITCH >			
S001	1-762-551-21	SWITCH, PUSH (L/S CAS)			
S002	1-771-604-11	SWITCH, DETECTION (C IN)			
S003	1-771-604-11	SWITCH, DETECTION (CC DOWN)			

Ref. No.	Part No.	Description			
	A-1166-862-A	RP-243 BOARD, COMPLETE ************************			
		< CAPACITOR >			
C1001	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C1002	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C1003	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C1004	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C1005	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C2000	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2001	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
C2002	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
C2003	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2004	1-100-415-11	CERAMIC CHIP	0.47uF	10%	6.3V
C2005	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2006	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2007	1-100-415-11	CERAMIC CHIP	0.47uF	10%	6.3V
C2008	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2009	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2010	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2011	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2012	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2013	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2014	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2015	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
		< CONNECTOR >			
CN1001	1-818-441-91	CONNECTOR, BOARD TO BOARD 100P			
* CN1002	1-691-382-51	CONNECTOR, FFC/FPC 18P			
CN1003	1-691-359-51	CONNECTOR, FFC/FPC (ZIF) 21P			
CN1004	1-691-359-51	CONNECTOR, FFC/FPC (ZIF) 21P			
* CN1005	1-691-375-51	CONNECTOR, FFC/FPC (ZIF) 11P			
* CN2000	1-691-374-51	CONNECTOR, FFC/FPC 10P			
		< IC >			
IC1001	8-759-338-95	IC NJM2903V (TE2)			
IC2000	6-707-432-01	IC TLS26A102PFBR			
		< COIL >			
L2000	1-469-967-21	INDUCTOR	10uH		
L2001	1-469-967-21	INDUCTOR	10uH		
L2002	1-469-967-21	INDUCTOR	10uH		
		< TRANSISTOR >			
Q1001	8-729-037-52	TRANSISTOR	2SD2216J-QR (TX).SO		
		< RESISTOR >			
R1004	1-218-990-81	SHORT CHIP	0		
R1099	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1100	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1101	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1102	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1106	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1107	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1110	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R1111	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R2003	1-218-965-11	RES-CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			
R2004	1-218-969-11	RES-CHIP	22K	5%	1/16W
R2007	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2008	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R2009	1-208-715-11	METAL CHIP	22K	0.5%	1/16W
R2011	1-208-909-11	METAL CHIP	8.2K	0.5%	1/16W
R2013	1-208-909-11	METAL CHIP	8.2K	0.5%	1/16W
R2014	1-218-990-81	SHORT CHIP	0		
R2015	1-208-715-11	METAL CHIP	22K	0.5%	1/16W
R2018	1-208-869-11	METAL CHIP	180	0.5%	1/16W
R2019	1-208-869-11	METAL CHIP	180	0.5%	1/16W
R2020	1-208-869-11	METAL CHIP	180	0.5%	1/16W
R2021	1-208-869-11	METAL CHIP	180	0.5%	1/16W

A-1179-556-A VD-036 BOARD, COMPLETE (SERVICE)
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(IC2601, IC4202 and LP001 are not supplied, but they are included in VD-036 complete board.)

< BATTERY >

Ref. No.	Part No.	Description
⚠BT1001	1-756-128-11	BATTERY, LITHIUM (SECONDARY)

< CAPACITOR >

Ref. No.	Part No.	Description			
C1002	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C1003	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C1004	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1005	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1007	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1008	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1009	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1010	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1011	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1012	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C1013	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1014	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1015	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1016	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1018	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1021	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C1023	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C1024	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C1026	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C1027	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1028	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1029	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1030	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
C1031	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C1033	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1034	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
C1036	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
C1037	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
C1038	1-137-910-11	TANTAL. CHIP	10uF	20%	16V

CAUTION
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

注意
電池の交換は，正しく行わないと破裂する恐れがあります。電池を交換する場合には必ず同じ型名の電池又は同等品と交換してください。

Ref. No.	Part No.	Description			
* C1041	1-112-298-91	CERAMIC CHIP	1uF	10%	16V
C1042	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1043	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1044	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1045	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1046	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1047	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1048	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1057	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1058	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1059	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1060	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1061	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1062	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1064	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1073	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1074	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1075	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1076	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1077	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1078	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C1079	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1080	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1081	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1082	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1083	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1084	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1085	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1087	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C1090	1-113-991-11	TANTAL. CHIP	33uF	20%	16V
C1093	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C1094	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C1095	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1096	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1097	1-165-875-11	CERAMIC CHIP	10uF	10%	10V
C1098	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1099	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1201	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C1202	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C1203	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C1204	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C1205	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C1206	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1207	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1208	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1209	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1211	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1212	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C1213	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1214	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C1215	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1216	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1217	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1219	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1221	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C1224	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C1225	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V

• Refer to page 5-1 for mark ⚠.

Ref. No.	Part No.	Description			
C1226	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
C1227	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C1228	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C1229	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
C1232	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
C1233	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1235	1-113-991-11	TANTAL. CHIP	33uF	20%	16V
C1237	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
* C1240	1-112-298-91	CERAMIC CHIP	1uF	10%	16V
C1241	1-125-889-91	CERAMIC CHIP	2.2uF	10%	10V
C1242	1-125-889-91	CERAMIC CHIP	2.2uF	10%	10V
C1245	1-125-889-91	CERAMIC CHIP	2.2uF	10%	10V
C1246	1-125-889-91	CERAMIC CHIP	2.2uF	10%	10V
C1247	1-125-889-91	CERAMIC CHIP	2.2uF	10%	10V
C1249	1-125-889-91	CERAMIC CHIP	2.2uF	10%	10V
C1258	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1259	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1260	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1262	1-112-300-91	CERAMIC CHIP	4.7uF	10%	10V
C1263	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1264	1-165-875-11	CERAMIC CHIP	10uF	10%	10V
C1276	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C1277	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C1279	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C1280	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C1281	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C1282	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C1285	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C1288	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C1289	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1292	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1293	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1294	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1295	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1296	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C1297	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C1401	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1402	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1404	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1406	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C1407	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1409	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1410	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1411	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C1412	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1413	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C1415	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1417	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
* C1418	1-112-298-91	CERAMIC CHIP	1uF	10%	16V
C1420	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C1421	1-100-591-91	CERAMIC CHIP	1uF	10%	25V
C1422	1-127-738-91	CERAMIC CHIP	4.7uF	10%	25V
C1423	1-127-738-91	CERAMIC CHIP	4.7uF	10%	25V
C1424	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C1425	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1426	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C1430	1-128-400-11	ELECT CHIP	47uF	20%	25V
C1433	1-128-400-11	ELECT CHIP	47uF	20%	25V
C1435	1-128-709-21	TANTAL. CHIP	68uF	20%	10V
C1440	1-112-300-91	CERAMIC CHIP	4.7uF	10%	10V
C1445	1-112-300-91	CERAMIC CHIP	4.7uF	10%	10V
C1450	1-112-300-91	CERAMIC CHIP	4.7uF	10%	10V
C1451	1-112-300-91	CERAMIC CHIP	4.7uF	10%	10V
C1453	1-113-985-11	TANTAL. CHIP	10uF	20%	20V
C1454	1-112-300-91	CERAMIC CHIP	4.7uF	10%	10V
C1464	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1470	1-128-400-11	ELECT CHIP	47uF	20%	25V
C1471	1-113-991-11	TANTAL. CHIP	33uF	20%	16V
C1472	1-113-991-11	TANTAL. CHIP	33uF	20%	16V
C1473	1-113-991-11	TANTAL. CHIP	33uF	20%	16V
C1474	1-113-991-11	TANTAL. CHIP	33uF	20%	16V
C1475	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1476	1-127-738-91	CERAMIC CHIP	4.7uF	10%	25V
C1477	1-162-920-11	CERAMIC CHIP	27PF	5%	50V
C1478	1-128-400-11	ELECT CHIP	47uF	20%	25V
C1479	1-127-738-91	CERAMIC CHIP	4.7uF	10%	25V
C1480	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1481	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1482	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C1483	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1484	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C1485	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C1801	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1802	1-100-609-11	TANTAL. CHIP	220uF		5V
C1804	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1805	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1806	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1807	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C1808	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1809	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1810	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1811	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1812	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1813	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1814	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1816	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1818	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1819	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1820	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1821	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1822	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1823	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1824	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1825	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C1826	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C1827	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1828	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1829	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1830	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1831	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C1832	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1833	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1834	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1835	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1837	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V

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Ref. No.	Part No.	Description			
C1838	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1839	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1840	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1841	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1842	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1843	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1871	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1872	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1873	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C1875	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C1877	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1878	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1879	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1880	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1881	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1882	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2001	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2002	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2003	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2004	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C2005	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C2006	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C2007	1-165-897-11	TANTAL. CHIP	22uF	20%	10V
C2008	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C2009	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C2010	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C2011	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2012	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2013	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C2201	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C2202	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C2203	1-100-539-91	TANTAL. CHIP	47uF	20%	6.3V
C2204	1-100-539-91	TANTAL. CHIP	47uF	20%	6.3V
C2206	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C2208	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2209	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2210	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2211	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2212	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2213	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2214	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2215	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2216	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2217	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2219	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2220	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2221	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2222	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2224	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2225	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2226	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2227	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2228	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2229	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2230	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2231	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2232	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2233	1-100-539-91	TANTAL. CHIP	47uF	20%	6.3V
C2234	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2236	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2238	1-100-539-91	TANTAL. CHIP	47uF	20%	6.3V
C2239	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2240	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2401	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2502	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2503	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2601	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2602	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C2801	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C2802	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C2803	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2804	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2805	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2806	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2807	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C2808	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2809	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2810	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2811	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2812	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2813	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2814	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2815	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2816	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2817	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2818	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2819	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2820	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C2821	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2822	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3001	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C3002	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3003	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3004	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3005	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3006	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3008	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3009	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3010	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3011	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C3012	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3013	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C3015	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3016	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3017	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3018	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3019	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3020	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C3021	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3022	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3023	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3024	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3025	1-100-415-11	CERAMIC CHIP	0.47uF	10%	6.3V
C3026	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3027	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V

Ref. No.	Part No.	Description			
C3201	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3202	1-164-933-11	CERAMIC CHIP	220PF	10%	50V
C3203	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3204	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3205	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C3206	1-164-852-11	CERAMIC CHIP	12PF	5%	50V
C3207	1-164-852-11	CERAMIC CHIP	12PF	5%	50V
C3208	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3209	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3210	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3211	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3212	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3214	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3215	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3216	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3217	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3218	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3219	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3220	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3600	1-165-875-11	CERAMIC CHIP	10uF	10%	10V
C3601	1-165-875-11	CERAMIC CHIP	10uF	10%	10V
C3602	1-165-875-11	CERAMIC CHIP	10uF	10%	10V
C3603	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C3604	1-164-936-11	CERAMIC CHIP	680PF	10%	50V
C3605	1-164-870-11	CERAMIC CHIP	68PF	5%	50V
C3606	1-164-870-11	CERAMIC CHIP	68PF	5%	50V
C3607	1-164-936-11	CERAMIC CHIP	680PF	10%	50V
C3608	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C3609	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C3611	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C3613	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C3614	1-137-934-91	TANTAL. CHIP	47uF	20%	10V
C3615	1-164-939-11	CERAMIC CHIP	0.0022uF	10%	50V
C3616	1-100-743-91	CERAMIC CHIP	2.2uF	20%	16V
C3617	1-128-964-91	TANTAL. CHIP	100uF	20%	6.3V
C3618	1-137-689-91	TANTAL. CHIP	47uF	20%	16V
C3619	1-137-934-91	TANTAL. CHIP	47uF	20%	10V
C3620	1-100-539-91	TANTAL. CHIP	47uF	20%	6.3V
C3621	1-164-939-11	CERAMIC CHIP	0.0022uF	10%	50V
C3622	1-100-743-91	CERAMIC CHIP	2.2uF	20%	16V
C3623	1-119-751-11	TANTAL. CHIP	22uF	20%	16V
C3624	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3625	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3626	1-100-539-91	TANTAL. CHIP	47uF	20%	6.3V
C3627	1-100-539-91	TANTAL. CHIP	47uF	20%	6.3V
C3628	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C3629	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3630	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C3631	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3632	1-165-897-11	TANTAL. CHIP	22uF	20%	10V
C3633	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3634	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3635	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3636	1-164-935-11	CERAMIC CHIP	470PF	10%	50V
C3637	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C3638	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3639	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C3640	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3641	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3642	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3643	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3644	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C3645	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C3646	1-119-751-11	TANTAL. CHIP	22uF	20%	16V
C3647	1-165-875-11	CERAMIC CHIP	10uF	10%	10V
C3648	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C3649	1-119-751-11	TANTAL. CHIP	22uF	20%	16V
C3650	1-137-689-91	TANTAL. CHIP	47uF	20%	16V
C3651	1-137-689-91	TANTAL. CHIP	47uF	20%	16V
C3652	1-137-910-11	TANTAL. CHIP	10uF	20%	16V
C3653	1-127-820-11	CERAMIC CHIP	4.7uF	10%	16V
C3663	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3664	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C3667	1-100-672-11	CERAMIC CHIP	10uF	20%	16V
C3668	1-100-672-11	CERAMIC CHIP	10uF	20%	16V
C4001	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4002	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4003	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4004	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4005	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4006	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4007	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4008	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4009	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4010	1-100-415-11	CERAMIC CHIP	0.47uF	10%	6.3V
C4011	1-100-415-11	CERAMIC CHIP	0.47uF	10%	6.3V
C4012	1-100-415-11	CERAMIC CHIP	0.47uF	10%	6.3V
C4013	1-164-874-11	CERAMIC CHIP	100PF	5%	50V
C4014	1-164-874-11	CERAMIC CHIP	100PF	5%	50V
C4015	1-164-874-11	CERAMIC CHIP	100PF	5%	50V
C4016	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4017	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4018	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4019	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4020	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4028	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4030	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4031	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4032	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4033	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4034	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4035	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4036	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4037	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4038	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4039	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4041	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C4042	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C4043	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C4044	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C4045	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C4060	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4061	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4062	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4063	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V

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Ref. No.	Part No.	Description			
C4067	1-100-591-91	CERAMIC CHIP	1uF	10%	25V
C4201	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4202	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C4204	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C4205	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C4208	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4209	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4401	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4402	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4404	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4601	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4602	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C4603	1-100-611-91	CERAMIC CHIP	22uF	20%	6.3V
C4604	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C4605	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C4606	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C4609	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4610	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C4611	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C4612	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4613	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C4614	1-125-889-91	CERAMIC CHIP	2.2uF	10%	10V
C4615	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4616	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4623	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C4624	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C4625	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
* C4626	1-112-298-91	CERAMIC CHIP	1uF	10%	16V
C4627	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C5000	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C5001	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C5002	1-164-850-11	CERAMIC CHIP	10PF	0.5PF	50V
C5003	1-164-850-11	CERAMIC CHIP	10PF	0.5PF	50V
C5004	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C5005	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5006	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5007	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5008	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5009	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5010	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5011	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C5012	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C5013	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C5014	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C5015	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C5016	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C5401	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C5402	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5403	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5404	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C5405	1-127-738-91	CERAMIC CHIP	4.7uF	10%	25V
C5406	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C5407	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C5408	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5411	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C5412	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5413	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C5414	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V

Ref. No.	Part No.	Description			
C5415	1-127-738-91	CERAMIC CHIP	4.7uF	10%	25V
C5416	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5417	1-127-738-91	CERAMIC CHIP	4.7uF	10%	25V
C5418	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C5419	1-164-934-11	CERAMIC CHIP	330PF	10%	50V
C5420	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C5421	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C5423	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C5424	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C5425	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5427	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5428	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5429	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5430	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C5431	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C5432	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C5434	1-119-923-11	CERAMIC CHIP	0.047uF	10%	10V
C5435	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5436	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C5438	1-164-941-11	CERAMIC CHIP	0.0047uF	10%	16V
C5439	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5440	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5442	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5443	1-100-566-91	CERAMIC CHIP	0.1uF	10%	25V
C5444	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5447	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C5448	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5449	1-164-935-11	CERAMIC CHIP	470PF	10%	50V
C5450	1-164-935-11	CERAMIC CHIP	470PF	10%	50V
C5451	1-164-935-11	CERAMIC CHIP	470PF	10%	50V
C5452	1-164-935-11	CERAMIC CHIP	470PF	10%	50V
C5453	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5454	1-164-931-11	CERAMIC CHIP	100PF	10%	50V
C5455	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5456	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5457	1-125-889-91	CERAMIC CHIP	2.2uF	10%	10V
C5458	1-164-942-11	CERAMIC CHIP	0.0068uF	10%	16V
C5459	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C5460	1-164-942-11	CERAMIC CHIP	0.0068uF	10%	16V
C5461	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5462	1-164-931-11	CERAMIC CHIP	100PF	10%	50V
C5463	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5464	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5465	1-164-858-11	CERAMIC CHIP	22PF	5%	50V
C5466	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C5467	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C5470	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C5476	1-127-738-91	CERAMIC CHIP	4.7uF	10%	25V
C5477	1-113-985-11	TANTAL. CHIP	10uF	20%	20V
C5478	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C5479	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C5480	1-125-889-91	CERAMIC CHIP	2.2uF	10%	10V
C6401	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6402	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6403	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C6404	1-128-934-61	CERAMIC CHIP	0.33uF	10%	10V
C6405	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V

Ref. No.	Part No.	Description			
C6406	1-127-772-81	CERAMIC CHIP	33000PF	10%	10V
C6407	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C6408	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C6409	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C6410	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C6411	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C6412	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C6413	1-165-897-11	TANTAL. CHIP	22uF	20%	10V
C6414	1-128-934-61	CERAMIC CHIP	0.33uF	10%	10V
C6415	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C6416	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C6417	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6418	1-128-934-61	CERAMIC CHIP	0.33uF	10%	10V
C6419	1-164-878-11	CERAMIC CHIP	150PF	5%	50V
C6420	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C6421	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6422	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C6424	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C6425	1-165-884-91	CERAMIC CHIP	2.2uF	10%	6.3V
C6426	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6427	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6428	1-100-609-11	TANTAL. CHIP	220uF		5V
C6429	1-100-609-11	TANTAL. CHIP	220uF		5V
C6430	1-165-897-11	TANTAL. CHIP	22uF	20%	10V
C6431	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C6601	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6602	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C6603	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C6604	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C6605	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C6606	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6607	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6608	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6609	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6610	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6611	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C6612	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6613	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6614	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6615	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6616	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6617	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6618	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6619	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6620	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6621	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6622	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6624	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6625	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6626	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C6627	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6628	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
		< CONNECTOR >			
CN1401	1-506-485-11	PIN, CONNECTOR 6P			
* CN2002	1-580-789-22	PIN, CONNECTOR (SMD) 6P			
CN3201	1-580-756-21	PIN, CONNECTOR (SMD) 7P			
* CN3601	1-566-528-61	CONNECTOR, FPC (ZIF) 12P			

Ref. No.	Part No.	Description	
CN4001	1-506-481-11	PIN, CONNECTOR 2P	
CN4002	1-750-303-41	CONNECTOR, BOARD TO BOARD 20P	
* CN4601	1-818-817-51	FFC/FPC CONNECTOR (ZIF) 40P	
* CN4602	1-691-348-51	CONNECTOR, FFC/FPC (ZIF) 10P	
* CN5401	1-695-320-21	PIN, CONNECTOR (1.5mm) (SMD) 2P	
CN5402	1-785-848-91	CONNECTOR, BOARD TO BOARD 100P	
CN5403	1-695-320-31	PIN, CONNECTOR (1.5mm) (SMD) 2P	
* CN6401	1-764-007-11	PIN, CONNECTOR (SMD) 12P	
		< DIODE >	
D1003	8-719-027-76	DIODE	1SS357-TPH3
D1006	8-719-085-52	DIODE	SBS806M-TL-E
D1008	6-500-813-01	DIODE	MA2SD32008S0
D1009	6-500-813-01	DIODE	MA2SD32008S0
D1010	8-719-069-28	DIODE	1SS400TE-61
D1011	6-500-813-01	DIODE	MA2SD32008S0
D1203	8-719-085-52	DIODE	SBS806M-TL-E
D1205	8-719-074-08	DIODE	MA4ZD03001S0
D1401	8-719-067-56	DIODE	MA112-TX
D1402	8-719-067-56	DIODE	MA112-TX
D1403	8-719-067-56	DIODE	MA112-TX
D1404	8-719-067-56	DIODE	MA112-TX
D1405	8-719-067-56	DIODE	MA112-TX
D1406	8-719-067-56	DIODE	MA112-TX
D1407	8-719-073-28	DIODE	MA729-(K8).S0
D1409	8-719-067-56	DIODE	MA112-TX
D1411	8-719-066-98	DIODE	RB051L-40TE25
D1413	8-719-062-16	DIODE	01ZA8.2 (TPL3)
D1416	8-719-067-56	DIODE	MA112-TX
D1418	8-719-062-16	DIODE	01ZA8.2 (TPL3)
D1419	8-719-067-56	DIODE	MA112-TX
D1420	8-719-056-23	DIODE	MA2S111-(K8).SO
D3001	6-500-275-01	DIODE	RB751S-40TE61
D3002	6-500-275-01	DIODE	RB751S-40TE61
D3003	6-500-818-01	DIODE	KV1870RTL-G
D3600	8-719-067-56	DIODE	MA112-TX
D3601	8-719-067-56	DIODE	MA112-TX
D3602	8-719-056-23	DIODE	MA2S111-(K8).SO
D4001	8-719-056-23	DIODE	MA2S111-(K8).SO
D4002	8-719-056-23	DIODE	MA2S111-(K8).SO
D4004	8-719-067-56	DIODE	MA112-TX
D4005	8-719-067-56	DIODE	MA112-TX
D4006	8-719-067-56	DIODE	MA112-TX
D4603	8-719-069-28	DIODE	1SS400TE-61
D4604	6-500-813-01	DIODE	MA2SD32008S0
D4605	6-500-813-01	DIODE	MA2SD32008S0
D5001	8-719-069-28	DIODE	1SS400TE-61
D5401	8-719-066-98	DIODE	RB051L-40TE25
		< FUSE >	
⚠F1001	1-576-406-21	FUSE (1.4A/32V)	
⚠F1002	1-576-406-21	FUSE (1.4A/32V)	
⚠F1003	1-576-406-21	FUSE (1.4A/32V)	
⚠F1004	1-576-406-21	FUSE (1.4A/32V)	
⚠F1005	1-576-406-21	FUSE (1.4A/32V)	
⚠F1201	1-576-406-21	FUSE (1.4A/32V)	
⚠F1202	1-576-406-21	FUSE (1.4A/32V)	

• Refer to page 5-1 for mark ⚠.

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Ref. No.	Part No.	Description
⚠F1203	1-576-406-21	FUSE (1.4A/32V)
⚠F1204	1-576-406-21	FUSE (1.4A/32V)
⚠F1205	1-576-406-21	FUSE (1.4A/32V)
⚠F1401	1-576-864-21	FUSE (0.8A/72V)
⚠F1402	1-576-447-21	FUSE (630mA/24V)
⚠F1403	1-576-864-21	FUSE (0.8A/72V)
⚠F1404	1-576-864-21	FUSE (0.8A/72V)
⚠F1407	1-576-864-21	FUSE (0.8A/72V)
⚠F1409	1-576-864-21	FUSE (0.8A/72V)
⚠F1410	1-576-864-21	FUSE (0.8A/72V)
⚠F1412	1-576-406-21	FUSE (1.4A/32V)
⚠* F1413	1-576-980-21	FUSE (1.25A/72V)
⚠F1419	1-576-447-21	FUSE (630mA/24V)
		< FERRITE BEAD >
FB1407	1-414-864-11	FERRITE, EMI (SMD) (1608)
FB1801	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB1803	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB1804	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB2001	1-414-445-11	FERRITE, EMI (SMD) (1608)
FB2002	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB2202	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB2601	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB2802	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB2803	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB3001	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB3201	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB3202	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
FB4001	1-400-619-11	BEAD, FERRITE (CHIP) (1608)
FB4002	1-400-619-11	BEAD, FERRITE (CHIP) (1608)
FB4003	1-400-619-11	BEAD, FERRITE (CHIP) (1608)
FB4004	1-400-619-11	BEAD, FERRITE (CHIP) (1608)
FB4201	1-400-331-11	FERRITE, EMI (SMD) (1005)
FB4601	1-400-619-11	BEAD, FERRITE (CHIP) (1608)
FB5000	1-400-619-11	BEAD, FERRITE (CHIP) (1608)
FB6401	1-414-760-21	BEAD, FERRITE (CHIP) (1608)
		< IC >
IC1001	6-706-539-01	IC AN30205A-VB
IC1002	6-700-709-01	IC NJU7241F31 (TE2)
IC1003	8-759-642-45	IC TL1596CPWR
IC1004	6-707-676-01	IC S-8424AAPFT-TB-G
IC1005	6-707-674-01	IC S-812C36AUA-C2QT2G
IC1006	6-707-086-01	IC S-80851CNMC-B9CT2G
IC1201	6-706-539-01	IC AN30205A-VB
IC1203	6-708-133-01	IC TK72130CSCL-G
IC1401	8-759-530-57	IC TLV431ACDBV2
IC1402	6-708-385-01	IC SN0408028DBTR
IC1403	8-759-523-54	IC TC4001BF (EL, N)
* IC1404	6-709-650-01	IC NJU7751F05 (TE2)
* IC1407	6-709-648-01	IC NJM2823F (TE2)
IC1409	8-759-494-88	IC TC75S56F (TE85R)
* IC1801	6-709-775-01	IC S4DF006X02-Y070-K02K4C
IC1871	8-759-643-94	IC TC7SLU04FU (TE85R)
IC1872	6-701-979-01	IC TC7WB66FK (TE85R)
* IC1873	6-709-937-01	IC TC7SA34FU (T5RSONYF)
* IC1874	6-709-937-01	IC TC7SA34FU (T5RSONYF)
* IC1875	6-709-937-01	IC TC7SA34FU (T5RSONYF)
* IC1876	6-709-937-01	IC TC7SA34FU (T5RSONYF)
IC2001	6-708-108-01	IC TLS26A100PFBR
* IC2202	8-753-259-30	IC CXD3195GG-T6
* IC2501	6-709-478-01	IC K4X56323PG-8GC3T
IC2601	(Not supplied)	IC S29AL016D70BFI013
IC2801	8-753-231-06	IC CXD3185GG-T6
IC3001	6-704-695-01	IC uPD15002AFC-DN2-E2-A
IC3201	6-705-546-01	IC SN104286ZHZR
IC3600	8-759-422-21	IC NJM4580V (TE2)
IC3601	6-707-170-01	IC M61534FP
IC3602	8-759-471-38	IC AK4520A-VF-E2
IC3603	6-706-484-01	IC TC7SH04FU (T5RSOYJF)
* IC4003	6-709-454-01	IC S4LF033X0A-Y070
IC4201	6-703-328-01	IC MSM56V16160F-10T3
IC4202	(Not supplied)	IC S99-50031-33-ER
IC4403	6-705-177-01	IC M95640-WDW6TG
* IC4601	6-806-647-01	IC MB89097PFV-G-195-BND-ERE1
IC4604	8-759-694-16	IC TC7WH241FK (TE85R)
* IC5000	6-806-698-01	IC MB91195ABGL-G-197-ERE1
IC5001	6-702-156-01	IC AK6510CM-E2
IC5401	8-759-339-61	IC LB1897D-E
IC5402	6-707-428-01	IC BD6639AGLV-E2
IC5403	8-759-327-61	IC LB8112V-TLM-E
IC5404	8-759-648-48	IC TC7W34FU (TE12R)
IC5405	8-759-492-30	IC MB3817PFV-G-BND
IC5406	6-705-337-01	IC TK11150CSCL-G
IC6401	6-701-555-01	IC AN2225NFHQBA
IC6601	6-701-740-01	IC MB87L4261LGA-G-ER
		< COIL >
L1003	1-419-354-21	INDUCTOR 22uH
L1004	1-419-354-21	INDUCTOR 22uH
L1005	1-419-354-21	INDUCTOR 22uH
L1006	1-419-354-21	INDUCTOR 22uH
L1007	1-419-354-21	INDUCTOR 22uH
L1008	1-419-354-21	INDUCTOR 22uH
L1009	1-419-354-21	INDUCTOR 22uH
L1013	1-469-549-21	INDUCTOR 1uH
L1014	1-469-549-21	INDUCTOR 1uH
L1015	1-469-549-21	INDUCTOR 1uH
L1016	1-469-549-21	INDUCTOR 1uH
L1017	1-469-555-21	INDUCTOR 10uH
L1018	1-469-549-21	INDUCTOR 1uH
L1019	1-469-555-21	INDUCTOR 10uH
L1020	1-469-553-21	INDUCTOR 4.7uH
L1021	1-469-549-21	INDUCTOR 1uH
L1022	1-469-555-21	INDUCTOR 10uH
L1023	1-469-555-21	INDUCTOR 10uH
L1024	1-469-555-21	INDUCTOR 10uH
L1025	1-400-588-11	INDUCTOR 10uH
L1026	1-400-588-11	INDUCTOR 10uH
L1205	1-419-354-21	INDUCTOR 22uH
L1206	1-419-354-21	INDUCTOR 22uH
L1207	1-419-354-21	INDUCTOR 22uH
L1208	1-416-670-51	INDUCTOR 33uH
L1209	1-419-354-21	INDUCTOR 22uH
L1211	1-419-354-21	INDUCTOR 22uH

- Refer to page 5-1 for mark ⚠.

Ref. No.	Part No.	Description	
L1214	1-469-555-21	INDUCTOR	10uH
L1216	1-469-549-21	INDUCTOR	1uH
L1217	1-469-549-21	INDUCTOR	1uH
L1218	1-469-549-21	INDUCTOR	1uH
L1219	1-469-555-21	INDUCTOR	10uH
L1222	1-469-555-21	INDUCTOR	10uH
L1223	1-469-555-21	INDUCTOR	10uH
L1404	1-416-606-11	INDUCTOR	47uH
L1406	1-416-758-21	INDUCTOR	22uH
L1410	1-409-535-41	INDUCTOR	100uH
L1801	1-400-675-11	INDUCTOR	10uH
L1802	1-400-676-11	INDUCTOR	22uH
L1803	1-400-588-11	INDUCTOR	10uH
L1804	1-400-676-11	INDUCTOR	22uH
L1805	1-400-588-11	INDUCTOR	10uH
L1871	1-469-549-21	INDUCTOR	1uH
L1872	1-469-526-91	INDUCTOR	22uH
L1873	1-469-526-91	INDUCTOR	22uH
L2001	1-400-588-11	INDUCTOR	10uH
L2002	1-400-588-11	INDUCTOR	10uH
L2003	1-400-588-11	INDUCTOR	10uH
L2201	1-400-675-11	INDUCTOR	10uH
L2203	1-400-676-11	INDUCTOR	22uH
L2204	1-400-676-11	INDUCTOR	22uH
L2205	1-400-676-11	INDUCTOR	22uH
L2206	1-400-676-11	INDUCTOR	22uH
L2207	1-400-135-11	INDUCTOR	1uH
L3001	1-469-570-11	INDUCTOR	10uH
L3002	1-469-570-11	INDUCTOR	10uH
L3003	1-469-546-21	INDUCTOR	0.56uH
L3005	1-469-570-11	INDUCTOR	10uH
L3006	1-469-570-11	INDUCTOR	10uH
L3007	1-469-570-11	INDUCTOR	10uH
L3008	1-469-570-11	INDUCTOR	10uH
L3009	1-469-570-11	INDUCTOR	10uH
L3201	1-469-570-11	INDUCTOR	10uH
L3600	1-469-058-11	INDUCTOR	22uH
L4001	1-412-029-11	INDUCTOR	10uH
L4201	1-414-754-11	INDUCTOR	10uH
L4202	1-414-754-11	INDUCTOR	10uH
L4601	1-414-754-11	INDUCTOR	10uH
L4602	1-412-029-11	INDUCTOR	10uH
L4604	1-414-754-11	INDUCTOR	10uH
L4605	1-400-588-11	INDUCTOR	10uH
L5401	1-469-967-21	INDUCTOR	10uH
L5402	1-469-967-21	INDUCTOR	10uH
L5403	1-400-588-11	INDUCTOR	10uH
L5404	1-419-353-21	INDUCTOR	10uH
L5405	1-416-669-11	INDUCTOR	22uH
L6401	1-469-967-21	INDUCTOR	10uH
L6402	1-469-967-21	INDUCTOR	10uH
L6403	1-412-939-11	INDUCTOR	1uH
L6404	1-469-967-21	INDUCTOR	10uH
L6601	1-469-967-21	INDUCTOR	10uH
L6602	1-469-967-21	INDUCTOR	10uH
L6603	1-469-967-21	INDUCTOR	10uH

Ref. No.	Part No.	Description	
		< LINE FILTER >	
LF3201	1-400-476-11	COMMON MODE CHOKE COIL	
		< LEAD PIN >	
LP001	(Not supplied)	PIN, LEAD	
		< TRANSISTOR >	
Q1002	8-729-037-63	TRANSISTOR	UN9115J-(TX).SO
Q1003	8-729-037-74	TRANSISTOR	UN9213J-(TX).SO
Q1004	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1005	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1006	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1007	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1008	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1009	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1011	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1014	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1015	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1016	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1017	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1018	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1019	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1020	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1022	8-729-049-25	TRANSISTOR	2SC5376F-B (TPL3)
Q1023	6-550-238-01	TRANSISTOR	DTA114EMT2L
Q1024	8-729-905-35	TRANSISTOR	2SC4081-R
Q1025	8-729-905-35	TRANSISTOR	2SC4081-R
Q1201	8-729-037-63	TRANSISTOR	UN9115J-(TX).SO
Q1202	8-729-037-74	TRANSISTOR	UN9213J-(TX).SO
Q1203	8-729-037-74	TRANSISTOR	UN9213J-(TX).SO
Q1205	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1206	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1207	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1209	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1210	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1211	6-550-675-01	TRANSISTOR	SSM6K30FE (TPLR3)
Q1215	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1216	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1217	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1219	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1220	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1221	6-550-713-01	TRANSISTOR	SCH2816-TL-E
Q1222	8-729-049-25	TRANSISTOR	2SC5376F-B (TPL3)
Q1401	8-729-048-50	TRANSISTOR	2SK3018-T106
Q1402	8-729-041-23	TRANSISTOR	NDS356AP
Q1403	8-729-026-52	TRANSISTOR	2SA1576A-T106-R
Q1404	8-729-048-50	TRANSISTOR	2SK3018-T106
Q1405	8-729-048-50	TRANSISTOR	2SK3018-T106
Q1406	8-729-048-50	TRANSISTOR	2SK3018-T106
Q1407	8-729-041-23	TRANSISTOR	NDS356AP
Q1408	8-729-048-50	TRANSISTOR	2SK3018-T106
Q1409	8-729-048-50	TRANSISTOR	2SK3018-T106
Q1410	6-551-380-01	TRANSISTOR	SI4425BDY-T1
Q1411	8-729-905-35	TRANSISTOR	2SC4081-R
Q1412	8-729-905-35	TRANSISTOR	2SC4081-R
Q1415	8-729-048-50	TRANSISTOR	2SK3018-T106
Q1417	8-729-037-72	TRANSISTOR	UN9211J-(TX).SO

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Ref. No.	Part No.	Description			
Q1418	8-729-056-72	TRANSISTOR	MCH5805-TL-E		
Q1419	8-729-037-72	TRANSISTOR	UN9211J-(TX).SO		
Q1420	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
* Q1422	6-551-522-01	TRANSISTOR	CPH6414-TL-E		
Q1423	8-729-048-50	TRANSISTOR	2SK3018-T106		
Q1424	8-729-041-23	TRANSISTOR	NDS356AP		
Q1425	8-729-048-11	TRANSISTOR	CPH3304-TL-E-S		
Q1426	8-729-905-35	TRANSISTOR	2SC4081-R		
Q1427	8-729-905-35	TRANSISTOR	2SC4081-R		
Q1428	8-729-905-35	TRANSISTOR	2SC4081-R		
* Q1430	6-551-522-01	TRANSISTOR	CPH6414-TL-E		
* Q1431	6-551-522-01	TRANSISTOR	CPH6414-TL-E		
Q2001	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q2002	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q2003	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q2004	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q2005	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q2007	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q2008	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q2009	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q3600	8-729-202-38	TRANSISTOR	2SC3326N-A		
Q3601	8-729-202-38	TRANSISTOR	2SC3326N-A		
Q3602	8-729-037-72	TRANSISTOR	UN9211J-(TX).SO		
Q3603	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q3604	6-550-232-01	TRANSISTOR	2SA2029T2LQ/R		
Q3605	8-729-037-72	TRANSISTOR	UN9211J-(TX).SO		
Q3606	8-729-905-35	TRANSISTOR	2SC4081-R		
Q3607	8-729-905-35	TRANSISTOR	2SC4081-R		
Q3608	8-729-905-35	TRANSISTOR	2SC4081-R		
Q3615	6-550-237-01	TRANSISTOR	2SC5658T2LQ/R		
Q3616	6-550-237-01	TRANSISTOR	2SC5658T2LQ/R		
Q3617	8-729-037-61	TRANSISTOR	UN9113J-(TX).SO		
Q3618	8-729-037-61	TRANSISTOR	UN9113J-(TX).SO		
Q3619	8-729-905-35	TRANSISTOR	2SC4081-R		
Q4002	6-550-237-01	TRANSISTOR	2SC5658T2LQ/R		
Q4003	6-550-119-01	TRANSISTOR	DTC144EMT2L		
Q4004	6-550-239-01	TRANSISTOR	DTA144EMT2L		
Q4005	8-729-053-54	TRANSISTOR	HN1A01FE-Y/GR (TPLR3)		
Q4006	6-550-174-01	TRANSISTOR	2SA2030T2L		
Q4007	8-729-041-23	TRANSISTOR	NDS356AP		
Q4008	8-729-037-72	TRANSISTOR	UN9211J-(TX).SO		
Q4604	8-729-037-74	TRANSISTOR	UN9213J-(TX).SO		
Q5401	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
Q5402	8-729-037-52	TRANSISTOR	2SD2216J-QR (TX).SO		
Q5403	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
Q5404	8-729-048-75	TRANSISTOR	CPH3109-TL-E		
Q5405	8-729-037-52	TRANSISTOR	2SD2216J-QR (TX).SO		
Q6401	8-729-037-52	TRANSISTOR	2SD2216J-QR (TX).SO		
Q6603	8-729-054-48	TRANSISTOR	UP04601008S0		
		< RESISTOR >			
R1016	1-242-967-81	RES-CHIP	1	5%	1/16W
R1017	1-216-864-11	SHORT CHIP	0		
R1022	1-216-789-11	METAL CHIP	2.2	5%	1/10W
R1029	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R1030	1-216-845-11	METAL CHIP	100K	5%	1/10W
R1032	1-218-963-11	RES-CHIP	6.8K	5%	1/16W

Ref. No.	Part No.	Description			
R1033	1-218-967-11	RES-CHIP	15K	5%	1/16W
R1034	1-218-971-11	RES-CHIP	33K	5%	1/16W
R1035	1-218-877-11	METAL CHIP	18K	0.5%	1/10W
R1036	1-218-847-11	METAL CHIP	1K	0.5%	1/10W
R1038	1-218-971-11	RES-CHIP	33K	5%	1/16W
R1039	1-216-864-11	SHORT CHIP	0		
R1040	1-218-971-11	RES-CHIP	33K	5%	1/16W
R1041	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1042	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1043	1-216-817-11	METAL CHIP	470	5%	1/10W
R1044	1-218-446-11	METAL CHIP	1	5%	1/10W
R1046	1-218-869-11	METAL CHIP	8.2K	0.5%	1/10W
R1047	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1049	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R1050	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1052	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R1054	1-218-847-11	METAL CHIP	1K	0.5%	1/10W
R1060	1-216-864-11	SHORT CHIP	0		
R1064	1-216-864-11	SHORT CHIP	0		
R1068	1-216-864-11	SHORT CHIP	0		
R1072	1-216-793-11	METAL CHIP	4.7	5%	1/10W
R1073	1-216-864-11	SHORT CHIP	0		
R1075	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R1076	1-218-883-11	METAL CHIP	33K	0.5%	1/10W
R1081	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R1082	1-218-857-11	METAL CHIP	2.7K	0.5%	1/10W
R1084	1-216-845-11	METAL CHIP	100K	5%	1/10W
R1085	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1086	1-216-853-11	METAL CHIP	470K	5%	1/10W
R1087	1-216-809-11	METAL CHIP	100	5%	1/10W
R1088	1-218-882-11	METAL CHIP	30K	0.5%	1/10W
R1089	1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R1090	1-218-446-11	METAL CHIP	1	5%	1/10W
R1092	1-218-446-11	METAL CHIP	1	5%	1/10W
R1093	1-218-446-11	METAL CHIP	1	5%	1/10W
R1094	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R1095	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1096	1-216-864-11	SHORT CHIP	0		
R1097	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1098	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1099	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1100	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1101	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1102	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1103	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1105	1-216-809-11	METAL CHIP	100	5%	1/10W
R1107	1-216-809-11	METAL CHIP	100	5%	1/10W
R1108	1-216-846-11	METAL CHIP	120K	5%	1/10W
R1109	1-218-855-11	METAL CHIP	2.2K	0.5%	1/10W
R1110	1-218-877-11	METAL CHIP	18K	0.5%	1/10W
R1111	1-216-836-11	METAL CHIP	18K	5%	1/10W
R1112	1-216-842-11	METAL CHIP	56K	5%	1/10W
R1113	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1114	1-216-839-11	METAL CHIP	33K	5%	1/10W
R1205	1-242-967-81	RES-CHIP	1	5%	1/16W
R1207	1-216-864-11	SHORT CHIP	0		
R1208	1-216-864-11	SHORT CHIP	0		
R1210	1-218-871-11	METAL CHIP	10K	0.5%	1/10W

Ref. No.	Part No.	Description			
R1211	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R1212	1-217-806-11	RES-CHIP	1	5%	1/8W
R1214	1-216-864-11	SHORT CHIP	0		
R1215	1-216-789-11	METAL CHIP	2.2	5%	1/10W
R1218	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R1219	1-216-845-11	METAL CHIP	100K	5%	1/10W
R1221	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R1223	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R1224	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1225	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1226	1-216-864-11	SHORT CHIP	0		
R1227	1-218-971-11	RES-CHIP	33K	5%	1/16W
R1229	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1230	1-218-971-11	RES-CHIP	33K	5%	1/16W
R1231	1-218-839-11	METAL CHIP	470	0.5%	1/10W
R1232	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R1233	1-216-864-11	SHORT CHIP	0		
R1234	1-218-446-11	METAL CHIP	1	5%	1/10W
R1235	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1236	1-216-797-11	METAL CHIP	10	5%	1/10W
R1241	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R1242	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1255	1-218-990-81	SHORT CHIP	0		
R1256	1-218-990-81	SHORT CHIP	0		
R1262	1-216-793-11	METAL CHIP	4.7	5%	1/10W
R1273	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1274	1-218-701-11	METAL CHIP	2.4K	0.5%	1/10W
R1285	1-216-846-11	METAL CHIP	120K	5%	1/10W
R1286	1-216-864-11	SHORT CHIP	0		
R1291	1-216-864-11	SHORT CHIP	0		
R1292	1-216-864-11	SHORT CHIP	0		
R1293	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1294	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1295	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1296	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1297	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1298	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1302	1-216-864-11	SHORT CHIP	0		
R1307	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R1402	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R1403	1-216-857-11	METAL CHIP	1M	5%	1/10W
R1404	1-218-981-11	RES-CHIP	220K	5%	1/16W
R1405	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1407	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1408	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1409	1-216-845-11	METAL CHIP	100K	5%	1/10W
R1411	1-218-903-11	METAL CHIP	220K	0.5%	1/10W
R1412	1-218-981-11	RES-CHIP	220K	5%	1/16W
R1417	1-216-857-11	METAL CHIP	1M	5%	1/10W
R1423	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R1424	1-216-857-11	METAL CHIP	1M	5%	1/10W
R1425	1-218-887-11	METAL CHIP	47K	0.5%	1/10W
R1426	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1427	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1428	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1429	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1430	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1431	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1432	1-218-909-11	METAL CHIP	390K	0.5%	1/10W
R1433	1-218-911-11	METAL CHIP	470K	0.5%	1/10W
R1434	1-218-896-11	METAL CHIP	110K	0.5%	1/10W
R1436	1-216-864-11	SHORT CHIP	0		
R1437	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R1438	1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R1439	1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R1440	1-218-903-11	METAL CHIP	220K	0.5%	1/10W
R1441	1-216-838-11	METAL CHIP	27K	5%	1/10W
R1443	1-218-849-11	METAL CHIP	1.2K	0.5%	1/10W
R1444	1-218-911-11	METAL CHIP	470K	0.5%	1/10W
R1447	1-218-853-11	METAL CHIP	1.8K	0.5%	1/10W
R1450	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R1451	1-216-814-11	METAL CHIP	270	5%	1/10W
R1452	1-218-891-11	METAL CHIP	68K	0.5%	1/10W
R1453	1-216-820-11	METAL CHIP	820	5%	1/10W
R1455	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1457	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1458	1-216-852-11	METAL CHIP	390K	5%	1/10W
R1459	1-218-859-11	METAL CHIP	3.3K	0.5%	1/10W
R1460	1-218-911-11	METAL CHIP	470K	0.5%	1/10W
R1461	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R1462	1-218-885-11	METAL CHIP	39K	0.5%	1/10W
R1468	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R1476	1-216-864-11	SHORT CHIP	0		
R1478	1-216-295-91	SHORT CHIP	0		
R1479	1-216-295-91	SHORT CHIP	0		
R1480	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1481	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1482	1-216-845-11	METAL CHIP	100K	5%	1/10W
R1497	1-218-823-11	METAL CHIP	100	0.5%	1/10W
R1498	1-218-903-11	METAL CHIP	220K	0.5%	1/10W
R1499	1-216-845-11	METAL CHIP	100K	5%	1/10W
R1500	1-218-978-11	RES-CHIP	120K	5%	1/16W
R1501	1-216-846-11	METAL CHIP	120K	5%	1/10W
R1502	1-216-841-11	METAL CHIP	47K	5%	1/10W
R1503	1-216-841-11	METAL CHIP	47K	5%	1/10W
R1504	1-216-834-11	METAL CHIP	12K	5%	1/10W
R1505	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1506	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1507	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1508	1-208-721-11	METAL CHIP	39K	0.5%	1/16W
R1509	1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R1510	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R1511	1-218-987-11	RES-CHIP	680K	5%	1/16W
R1512	1-218-981-11	RES-CHIP	220K	5%	1/16W
R1513	1-218-978-11	RES-CHIP	120K	5%	1/16W
R1514	1-216-846-11	METAL CHIP	120K	5%	1/10W
R1515	1-216-843-11	METAL CHIP	68K	5%	1/10W
R1516	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R1517	1-218-933-11	RES-CHIP	22	5%	1/16W
R1518	1-218-446-11	METAL CHIP	1	5%	1/10W
R1519	1-216-809-11	METAL CHIP	100	5%	1/10W
R1520	1-218-875-11	METAL CHIP	15K	0.5%	1/10W
R1523	1-216-864-11	SHORT CHIP	0		
R1524	1-216-864-11	SHORT CHIP	0		
R1525	1-218-875-11	METAL CHIP	15K	0.5%	1/10W

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Ref. No.	Part No.	Description			
R1526	1-218-929-11	RES-CHIP	10	5%	1/16W
R1527	1-216-797-11	METAL CHIP	10	5%	1/10W
R1528	1-216-797-11	METAL CHIP	10	5%	1/10W
R1532	1-216-864-11	SHORT CHIP	0		
R1542	1-216-864-11	SHORT CHIP	0		
R1555	1-216-864-11	SHORT CHIP	0		
R1556	1-216-864-11	SHORT CHIP	0		
R1558	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1565	1-216-864-11	SHORT CHIP	0		
R1801	1-218-990-81	SHORT CHIP	0		
R1802	1-218-990-81	SHORT CHIP	0		
R1803	1-218-990-81	SHORT CHIP	0		
R1804	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1806	1-218-990-81	SHORT CHIP	0		
R1807	1-208-711-11	METAL CHIP	15K	0.5%	1/16W
R1808	1-218-990-81	SHORT CHIP	0		
R1809	1-218-990-81	SHORT CHIP	0		
R1810	1-218-939-11	RES-CHIP	68	5%	1/16W
R1811	1-218-941-81	RES-CHIP	100	5%	1/16W
R1812	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1813	1-218-941-81	RES-CHIP	100	5%	1/16W
R1814	1-218-990-81	SHORT CHIP	0		
R1815	1-218-990-81	SHORT CHIP	0		
R1817	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1818	1-218-935-11	RES-CHIP	33	5%	1/16W
R1819	1-218-990-81	SHORT CHIP	0		
R1820	1-208-697-11	METAL CHIP	3.9K	0.5%	1/16W
R1821	1-208-697-11	METAL CHIP	3.9K	0.5%	1/16W
R1822	1-218-935-11	RES-CHIP	33	5%	1/16W
R1823	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1824	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1831	1-218-990-81	SHORT CHIP	0		
R1835	1-218-990-81	SHORT CHIP	0		
R1836	1-218-990-81	SHORT CHIP	0		
R1838	1-218-990-81	SHORT CHIP	0		
R1871	1-218-990-81	SHORT CHIP	0		
R1873	1-218-990-81	SHORT CHIP	0		
R1874	1-218-990-81	SHORT CHIP	0		
R1875	1-218-990-81	SHORT CHIP	0		
R1876	1-218-990-81	SHORT CHIP	0		
R1878	1-218-990-81	SHORT CHIP	0		
R1881	1-218-935-11	RES-CHIP	33	5%	1/16W
R1882	1-218-935-11	RES-CHIP	33	5%	1/16W
R1884	1-218-935-11	RES-CHIP	33	5%	1/16W
R1885	1-218-939-11	RES-CHIP	68	5%	1/16W
R1887	1-218-935-11	RES-CHIP	33	5%	1/16W
R1888	1-218-939-11	RES-CHIP	68	5%	1/16W
R1890	1-218-935-11	RES-CHIP	33	5%	1/16W
R1891	1-218-939-11	RES-CHIP	68	5%	1/16W
R1893	1-218-935-11	RES-CHIP	33	5%	1/16W
R1894	1-218-990-81	SHORT CHIP	0		
R1895	1-218-990-81	SHORT CHIP	0		
R2001	1-208-873-81	METAL CHIP	270	0.5%	1/16W
R2002	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2003	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2004	1-208-873-81	METAL CHIP	270	0.5%	1/16W
R2005	1-208-873-81	METAL CHIP	270	0.5%	1/16W
R2006	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2007	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R2008	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2009	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2010	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R2013	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R2014	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2015	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2016	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R2017	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R2018	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2035	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R2036	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R2037	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R2201	1-218-990-81	SHORT CHIP	0		
R2202	1-218-990-81	SHORT CHIP	0		
R2205	1-218-941-81	RES-CHIP	100	5%	1/16W
R2206	1-218-990-81	SHORT CHIP	0		
R2207	1-218-990-81	SHORT CHIP	0		
R2208	1-218-990-81	SHORT CHIP	0		
R2209	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2210	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2211	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2212	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2213	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2214	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2215	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2216	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2217	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2218	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2219	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2220	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2221	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2222	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2223	1-218-990-81	SHORT CHIP	0		
R2224	1-218-990-81	SHORT CHIP	0		
R2225	1-218-990-81	SHORT CHIP	0		
R2226	1-218-990-81	SHORT CHIP	0		
R2227	1-218-941-81	RES-CHIP	100	5%	1/16W
R2228	1-218-990-81	SHORT CHIP	0		
R2229	1-218-990-81	SHORT CHIP	0		
R2230	1-218-990-81	SHORT CHIP	0		
R2231	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2237	1-218-990-81	SHORT CHIP	0		
R2238	1-218-990-81	SHORT CHIP	0		
R2239	1-218-990-81	SHORT CHIP	0		
R2241	1-218-990-81	SHORT CHIP	0		
R2242	1-218-990-81	SHORT CHIP	0		
R2243	1-218-990-81	SHORT CHIP	0		
R2244	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2246	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2248	1-218-941-81	RES-CHIP	100	5%	1/16W
R2501	1-218-990-81	SHORT CHIP	0		
R2601	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2801	1-218-941-81	RES-CHIP	100	5%	1/16W
R2803	1-218-990-81	SHORT CHIP	0		
R2804	1-218-973-11	RES-CHIP	47K	5%	1/16W
R2805	1-218-953-11	RES-CHIP	1K	5%	1/16W

Ref. No.	Part No.	Description			
R2806	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2807	1-218-990-81	SHORT CHIP	0		
R2808	1-218-990-81	SHORT CHIP	0		
R2809	1-218-990-81	SHORT CHIP	0		
R2812	1-218-990-81	SHORT CHIP	0		
R2813	1-218-990-81	SHORT CHIP	0		
R3001	1-218-941-81	RES-CHIP	100	5%	1/16W
R3002	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3003	1-218-990-81	SHORT CHIP	0		
R3004	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3005	1-218-990-81	SHORT CHIP	0		
R3006	1-218-946-11	RES-CHIP	270	5%	1/16W
R3007	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R3008	1-218-941-81	RES-CHIP	100	5%	1/16W
R3013	1-218-990-81	SHORT CHIP	0		
R3015	1-218-990-81	SHORT CHIP	0		
R3018	1-218-990-81	SHORT CHIP	0		
R3019	1-218-990-81	SHORT CHIP	0		
R3020	1-218-990-81	SHORT CHIP	0		
R3021	1-218-941-81	RES-CHIP	100	5%	1/16W
R3022	1-218-941-81	RES-CHIP	100	5%	1/16W
R3023	1-218-990-81	SHORT CHIP	0		
R3201	1-218-938-11	RES-CHIP	56	5%	1/16W
R3202	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R3203	1-218-938-11	RES-CHIP	56	5%	1/16W
R3204	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R3205	1-218-938-11	RES-CHIP	56	5%	1/16W
R3206	1-218-938-11	RES-CHIP	56	5%	1/16W
R3207	1-208-702-11	METAL CHIP	6.2K	0.5%	1/16W
R3208	1-208-869-11	METAL CHIP	180	0.5%	1/16W
R3209	1-218-989-11	RES-CHIP	1M	5%	1/16W
R3210	1-218-990-81	SHORT CHIP	0		
R3211	1-218-990-81	SHORT CHIP	0		
R3212	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3213	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3214	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3215	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3216	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3217	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3218	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3219	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3220	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3221	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3222	1-218-990-81	SHORT CHIP	0		
R3223	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3224	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3225	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3226	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3600	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3601	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3602	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R3603	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R3604	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R3605	1-218-945-11	RES-CHIP	220	5%	1/16W
R3606	1-218-945-11	RES-CHIP	220	5%	1/16W
R3607	1-218-941-81	RES-CHIP	100	5%	1/16W
R3608	1-218-941-81	RES-CHIP	100	5%	1/16W
R3609	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R3610	1-208-711-11	METAL CHIP	15K	0.5%	1/16W
R3611	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3612	1-208-711-11	METAL CHIP	15K	0.5%	1/16W
R3613	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3614	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R3615	1-218-972-11	RES-CHIP	39K	5%	1/16W
R3616	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3618	1-218-964-11	RES-CHIP	8.2K	5%	1/16W
R3619	1-218-964-11	RES-CHIP	8.2K	5%	1/16W
R3620	1-218-990-81	SHORT CHIP	0		
R3621	1-218-929-11	RES-CHIP	10	5%	1/16W
R3622	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3623	1-218-960-11	RES-CHIP	3.9K	5%	1/16W
R3624	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3625	1-218-960-11	RES-CHIP	3.9K	5%	1/16W
R3626	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3627	1-218-969-11	RES-CHIP	22K	5%	1/16W
R3628	1-218-969-11	RES-CHIP	22K	5%	1/16W
R3629	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3630	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3631	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3632	1-218-990-81	SHORT CHIP	0		
R3633	1-218-990-81	SHORT CHIP	0		
R3634	1-218-990-81	SHORT CHIP	0		
R3635	1-216-001-00	RES-CHIP	10	5%	1/10W
R3636	1-218-990-81	SHORT CHIP	0		
R3637	1-218-953-11	RES-CHIP	1K	5%	1/16W
R3638	1-218-953-11	RES-CHIP	1K	5%	1/16W
R3639	1-218-990-81	SHORT CHIP	0		
R3640	1-218-985-11	RES-CHIP	470K	5%	1/16W
R3641	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3642	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3643	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3648	1-218-990-81	SHORT CHIP	0		
R3649	1-218-941-81	RES-CHIP	100	5%	1/16W
R3650	1-218-941-81	RES-CHIP	100	5%	1/16W
R3651	1-218-941-81	RES-CHIP	100	5%	1/16W
R3652	1-218-941-81	RES-CHIP	100	5%	1/16W
R3653	1-218-935-11	RES-CHIP	33	5%	1/16W
R3654	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3655	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3656	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3657	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3658	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3659	1-218-953-11	RES-CHIP	1K	5%	1/16W
R3660	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3661	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3662	1-208-910-11	METAL CHIP	9.1K	0.5%	1/16W
R3663	1-220-196-11	RES-CHIP	13K	5%	1/16W
R3665	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3674	1-218-990-81	SHORT CHIP	0		
R3699	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R3700	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3701	1-208-905-11	METAL CHIP	5.6K	0.5%	1/16W
R3702	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R3703	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3704	1-208-905-11	METAL CHIP	5.6K	0.5%	1/16W

Ref. No.	Part No.	Description			
R3705	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3706	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3707	1-218-969-11	RES-CHIP	22K	5%	1/16W
R4001	1-218-990-81	SHORT CHIP	0		
R4002	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4003	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4004	1-218-933-11	RES-CHIP	22	5%	1/16W
R4005	1-218-933-11	RES-CHIP	22	5%	1/16W
R4006	1-218-933-11	RES-CHIP	22	5%	1/16W
R4011	1-218-990-81	SHORT CHIP	0		
R4012	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4013	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4014	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4015	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4016	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4017	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4018	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4019	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4020	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4022	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4023	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4024	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4025	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4026	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4027	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4028	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4029	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4031	1-218-840-11	METAL CHIP	510	0.5%	1/10W
R4033	1-218-989-11	RES-CHIP	1M	5%	1/16W
R4035	1-218-990-81	SHORT CHIP	0		
R4037	1-218-990-81	SHORT CHIP	0		
R4041	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4042	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4043	1-218-935-11	RES-CHIP	33	5%	1/16W
R4044	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4045	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4065	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4066	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4067	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4068	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4069	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4070	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4071	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4072	1-218-973-11	RES-CHIP	47K	5%	1/16W
R4073	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R4074	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R4075	1-216-791-11	METAL CHIP	3.3	5%	1/10W
R4076	1-218-955-11	RES-CHIP	1.5K	5%	1/16W
R4077	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R4078	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R4079	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R4080	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R4081	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4082	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4083	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4086	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4087	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4096	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4097	1-218-973-11	RES-CHIP	47K	5%	1/16W
R4098	1-218-973-11	RES-CHIP	47K	5%	1/16W
R4099	1-218-973-11	RES-CHIP	47K	5%	1/16W
R4104	1-216-797-11	METAL CHIP	10	5%	1/10W
R4105	1-218-941-81	RES-CHIP	100	5%	1/16W
R4110	1-218-990-81	SHORT CHIP	0		
R4111	1-218-990-81	SHORT CHIP	0		
R4113	1-218-990-81	SHORT CHIP	0		
R4201	1-218-990-81	SHORT CHIP	0		
R4202	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4219	1-218-990-81	SHORT CHIP	0		
R4246	1-218-990-81	SHORT CHIP	0		
R4247	1-218-990-81	SHORT CHIP	0		
R4248	1-218-990-81	SHORT CHIP	0		
R4537	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4540	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4541	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4552	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4553	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4584	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4586	1-218-990-81	SHORT CHIP	0		
R4601	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4606	1-218-978-11	RES-CHIP	120K	5%	1/16W
R4607	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4608	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4609	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4613	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4614	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R4615	1-218-973-11	RES-CHIP	47K	5%	1/16W
R4616	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4619	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4620	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4625	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4629	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4631	1-245-604-11	METAL CHIP	10M	5%	1/16W
R4632	1-218-990-81	SHORT CHIP	0		
R4635	1-218-973-11	RES-CHIP	47K	5%	1/16W
R4639	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4640	1-218-989-11	RES-CHIP	1M	5%	1/16W
R4641	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4642	1-218-949-11	RES-CHIP	470	5%	1/16W
R4645	1-218-989-11	RES-CHIP	1M	5%	1/16W
R4646	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4647	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4648	1-216-182-00	RES-CHIP	220	5%	1/8W
R4649	1-216-182-00	RES-CHIP	220	5%	1/8W
R4650	1-216-182-00	RES-CHIP	220	5%	1/8W
R4651	1-216-182-00	RES-CHIP	220	5%	1/8W
R4657	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4662	1-218-965-11	RES-CHIP	10K	5%	1/16W
R4664	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4676	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4681	1-218-978-11	RES-CHIP	120K	5%	1/16W
R4687	1-218-990-81	SHORT CHIP	0		
R4693	1-218-990-81	SHORT CHIP	0		
R5006	1-218-941-81	RES-CHIP	100	5%	1/16W
R5007	1-218-965-11	RES-CHIP	10K	5%	1/16W

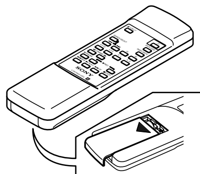
Ref. No.	Part No.	Description			
R5008	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5009	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5010	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5018	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5019	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5020	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5065	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5110	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5113	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5137	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5140	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5151	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5154	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5159	1-218-985-11	RES-CHIP	470K	5%	1/16W
R5160	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5163	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5164	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5167	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5239	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5240	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5242	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5243	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5244	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5245	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5248	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5249	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5254	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5255	1-208-943-11	METAL CHIP	220K	0.5%	1/16W
R5256	1-208-931-11	METAL CHIP	68K	0.5%	1/16W
R5257	1-218-990-81	SHORT CHIP	0		
R5401	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5402	1-216-864-11	SHORT CHIP	0		
R5403	1-208-918-81	METAL CHIP	20K	0.5%	1/16W
R5404	1-208-709-11	METAL CHIP	12K	0.5%	1/16W
R5405	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5406	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5407	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5408	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5409	1-208-702-11	METAL CHIP	6.2K	0.5%	1/16W
R5411	1-216-864-11	SHORT CHIP	0		
R5414	1-218-985-11	RES-CHIP	470K	5%	1/16W
R5415	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5416	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5417	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5418	1-217-671-11	RES-CHIP	1	5%	1/10W
R5419	1-217-671-11	RES-CHIP	1	5%	1/10W
R5420	1-217-671-11	RES-CHIP	1	5%	1/10W
R5421	1-216-864-11	SHORT CHIP	0		
R5422	1-217-671-11	RES-CHIP	1	5%	1/10W
R5423	1-218-990-81	SHORT CHIP	0		
R5426	1-218-941-81	RES-CHIP	100	5%	1/16W
R5427	1-216-789-11	METAL CHIP	2.2	5%	1/10W
R5428	1-216-789-11	METAL CHIP	2.2	5%	1/10W
R5429	1-216-789-11	METAL CHIP	2.2	5%	1/10W
R5433	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5436	1-216-864-11	SHORT CHIP	0		
R5438	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5440	1-220-877-81	METAL CHIP	20	0.5%	1/16W
R5442	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5444	1-218-967-11	RES-CHIP	15K	5%	1/16W
R5446	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5447	1-216-864-11	SHORT CHIP	0		
R5448	1-216-864-11	SHORT CHIP	0		
R5449	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5450	1-218-973-11	RES-CHIP	47K	5%	1/16W
R5453	1-218-990-81	SHORT CHIP	0		
R5454	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R5455	1-218-967-11	RES-CHIP	15K	5%	1/16W
R5456	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5459	1-216-833-11	METAL CHIP	10K	5%	1/10W
R5460	1-217-671-11	RES-CHIP	1	5%	1/10W
R5461	1-217-671-11	RES-CHIP	1	5%	1/10W
R5462	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5463	1-216-864-11	SHORT CHIP	0		
R5465	1-216-833-11	METAL CHIP	10K	5%	1/10W
R5468	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R5469	1-218-953-11	RES-CHIP	1K	5%	1/16W
R5470	1-216-833-11	METAL CHIP	10K	5%	1/10W
R5471	1-218-953-11	RES-CHIP	1K	5%	1/16W
R5472	1-218-990-81	SHORT CHIP	0		
R5473	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R5474	1-218-973-11	RES-CHIP	47K	5%	1/16W
R5475	1-218-973-11	RES-CHIP	47K	5%	1/16W
R5477	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R5478	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R5479	1-218-967-11	RES-CHIP	15K	5%	1/16W
R5480	1-218-977-11	RES-CHIP	100K	5%	1/16W
R5481	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R5482	1-218-950-11	RES-CHIP	560	5%	1/16W
R5483	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R5484	1-218-990-81	SHORT CHIP	0		
R5485	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R5486	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R5487	1-218-950-11	RES-CHIP	560	5%	1/16W
R5488	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R5489	1-218-953-11	RES-CHIP	1K	5%	1/16W
R5490	1-218-953-11	RES-CHIP	1K	5%	1/16W
R5491	1-218-953-11	RES-CHIP	1K	5%	1/16W
R5494	1-218-953-11	RES-CHIP	1K	5%	1/16W
R5495	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5496	1-218-965-11	RES-CHIP	10K	5%	1/16W
R5505	1-208-930-11	METAL CHIP	62K	0.5%	1/16W
R5508	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R5510	1-208-905-11	METAL CHIP	5.6K	0.5%	1/16W
R5511	1-218-953-11	RES-CHIP	1K	5%	1/16W
R6401	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R6402	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R6403	1-218-941-81	RES-CHIP	100	5%	1/16W
R6404	1-218-981-11	RES-CHIP	220K	5%	1/16W
R6405	1-220-884-81	METAL CHIP	39	0.5%	1/16W
R6406	1-220-883-81	METAL CHIP	36	0.5%	1/16W
R6407	1-220-884-81	METAL CHIP	39	0.5%	1/16W
R6408	1-220-883-81	METAL CHIP	36	0.5%	1/16W
R6409	1-220-884-81	METAL CHIP	39	0.5%	1/16W
R6410	1-220-883-81	METAL CHIP	36	0.5%	1/16W

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Ref. No.	Part No.	Description			
R6411	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6412	1-208-715-11	METAL CHIP	22K	0.5%	1/16W
R6413	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6414	1-218-973-11	RES-CHIP	47K	5%	1/16W
R6415	1-218-953-11	RES-CHIP	1K	5%	1/16W
R6416	1-218-953-11	RES-CHIP	1K	5%	1/16W
R6417	1-218-949-11	RES-CHIP	470	5%	1/16W
R6418	1-218-965-11	RES-CHIP	10K	5%	1/16W
R6419	1-218-953-11	RES-CHIP	1K	5%	1/16W
R6420	1-218-953-11	RES-CHIP	1K	5%	1/16W
R6421	1-218-953-11	RES-CHIP	1K	5%	1/16W
R6422	1-218-953-11	RES-CHIP	1K	5%	1/16W
R6424	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R6425	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R6426	1-208-860-81	METAL CHIP	75	0.5%	1/16W
R6601	1-218-937-11	RES-CHIP	47	5%	1/16W
R6604	1-218-965-11	RES-CHIP	10K	5%	1/16W
R6605	1-218-951-11	RES-CHIP	680	5%	1/16W
R6606	1-218-965-11	RES-CHIP	10K	5%	1/16W
R6607	1-218-949-11	RES-CHIP	470	5%	1/16W
R6608	1-218-990-81	SHORT CHIP	0		
R6612	1-218-990-81	SHORT CHIP	0		
R6614	1-218-990-81	SHORT CHIP	0		
R6615	1-218-941-81	RES-CHIP	100	5%	1/16W
R6617	1-218-990-81	SHORT CHIP	0		
R6618	1-218-935-11	RES-CHIP	33	5%	1/16W
		< COMPOSITION CIRCUIT BLOCK >			
RB5000	1-234-381-21	RES, NETWORK	100K (1005X4)		
RB5001	1-234-381-21	RES, NETWORK	100K (1005X4)		
		< SWITCH >			
S4602	1-572-272-11	SWITCH, SLIDE (50i/60i)			
		< TEST PIN >			
TP4001	1-535-757-11	CHIP, CHECKER			
		< VIBRATOR >			
X1871	1-813-458-11	OSCILLATOR, CRYSTAL (55.631868MHz)			
X1872	1-813-457-11	OSCILLATOR, CRYSTAL (55.6875MHz)			
X3201	1-795-921-11	VIBRATOR, CRYSTAL (24.576MHz)			
X4601	1-760-458-21	VIBRATOR, CRYSTAL (32.768kHz)			
X4602	1-795-244-11	VIBRATOR, CERAMIC (10MHz)			
X5000	1-767-205-21	VIBRATOR, CRYSTAL (20MHz)			
X6401	1-781-763-21	VIBRATOR, CRYSTAL (13.5MHZ)			

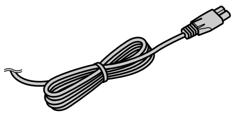
• EXCEPT J MODEL

Checking supplied accessories.



Battery Case Lid
(for RMT-DS5)
3-076-233-01

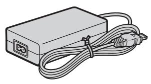
Remote Commander
(RMT-DS5)
1-477-220-11



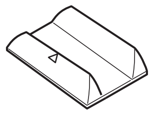
Power Cord
⚠ 1-790-107-42 (M15U)
⚠ 1-830-354-12 (M15N/M15E/M15P)
⚠ 1-782-476-51 (M15C)

Other accessories

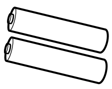
2-678-753-11	MANUAL, INSTRUCTION (ENGLISH) (M15U/M15N/M15E/M15P)
2-678-753-21	MANUAL, INSTRUCTION (FRENCH) (M15U/M15E)
2-678-753-31	MANUAL, INSTRUCTION (SPANISH, GERMAN, ITALIAN) (M15E)
2-678-753-41	MANUAL, INSTRUCTION (SIMPLIFIED CHINESE) (M15C)



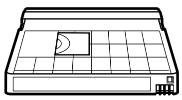
AC Adaptor
⚠ 1-479-283-13



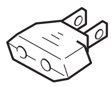
Rack
X-2050-152-1



Size AA Batteries
(not supplied)



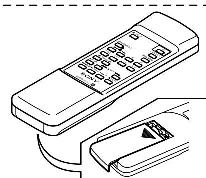
Cleaning Cassette
8-883-121-64



Conversion 2P Adaptor
⚠ 1-569-008-12 (M15N)

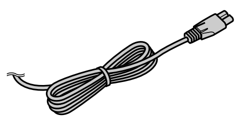
• J MODEL

付属品



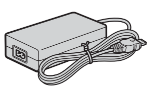
電池ぶた
(RMT-DS5用)
3-076-233-01

リモコン
(RMT-DS5)
1-477-220-11

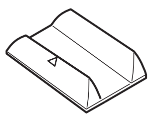


電源ケーブル
⚠ 1-790-732-71

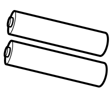
図面番号	部品コード	部品名
	2−678−753−01	取扱説明書（日本語）



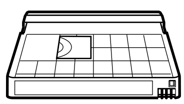
ACアダプター
⚠ 1-479-283-13



スタンド
X-2050-152-1



単3形乾電池
(供給せず)



クリーニングカセット
8-883-121-64

• Refer to page 5-1 for mark ⚠.

6. ADJUSTMENTS

Link

- Before starting adjustments
  - Adjusting items when replacing main parts and boards
  - List of service tools
  - Information (Mechanical Section)
- MECHANICAL SECTION ADJUSTMENTS
  - PARTS REPLACEMENT AND PREPARATION FOR ADJUSTMENT
  - PERIODIC CHECK
  - PARTS REPLACEMENT
  - CHECK AND ADJUSTMENT
- VIDEO SECTION ADJUSTMENTS
  - PREPARATIONS BEFORE ADJUSTMENTS
  - INITIALIZATION OF 8, 9, A, B, C, D, 13, 18, 1A, 1B, 1C, 1D PAGE DATA
  - SYSTEM CONTROL SYSTEM ADJUSTMENTS
  - SERVO AND RF SYSTEM ADJUSTMENTS
  - VIDEO SYSTEM ADJUSTMENTS
  - AUDIO SYSTEM ADJUSTMENTS
- SERVICE MODE
  - ADJUSTMENT REMOTE COMMANDER (RM-95)
  - ADJUSTMENT REMOTE COMMANDER (NEW LANC JIG)
  - DATA PROCESS
  - SERVICE MODE

SECTION 6
ADJUSTMENTS

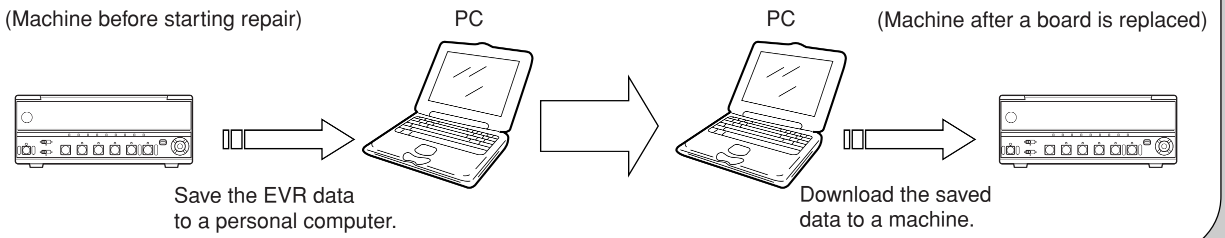
1. Before starting adjustment

EVR Data Re-writing Procedure When Replacing Board

The data that is stored in the repair board, is not necessarily correct.
Perform either procedure 1 or procedure 2 or procedure 3 when replacing board.

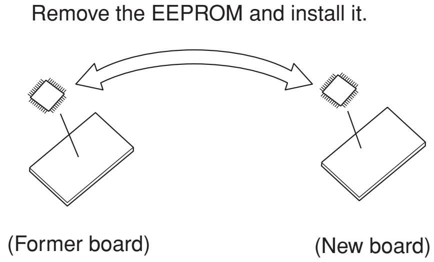
Procedure 1

Save the EVR data of the machine in which a board is going to be replaced. Download the saved data after a board is replaced.



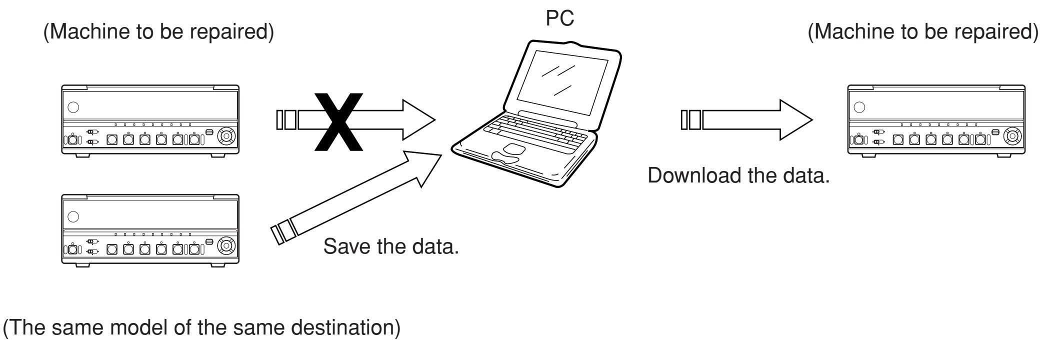
Procedure 2

Remove the EEPROM from the board of the machine that is going to be repaired. Install the removed EEPROM to the replaced board.



Procedure 3

When the data cannot be saved due to defective EEPROM, or when the EEPROM cannot be removed or installed, save the data from the same model of the same destination, and download it.



After the EVR data is saved and downloaded, check the respective items of the EVR data.
(Refer to page 6-2 for the items to be checked)

1-1. Adjusting items when replacing main parts and boards

When replacing main parts, adjust the items indicated by ● in the following table.

Note 1: When replacing the drum assy or the mechanism deck, reset the data of page: 7, address: A8 to AB to “00”. (Refer to “Record of Use check” of “6-3. SERVICE MODE”)

Note 2: IC2601 (Flash memory) and IC4202 (Flash memory) on VD-036 board cannot be replaced.

Adjustment Section	Adjustment	Replaced part: Block replacement			Replaced part: Mounted part replacement					Replaced part				Supporting
		Mechanism deck (Note 1)	Mechanism deck M901 (Drum assembly) (Note 1)	Mechanism deck M903 (Capstan motor)	RP-243 board IC2000 (REC/PB AMP)	VD-036 board IC1801 (Base band signal process, etc.)	VD-036 board IC3001 (DV signal process)	VD-036 board IC6401 (Video in/out)	VD-036 board IC2001 (Component out AMP)	RP-243 board (COMPLETE)	VD-036 board (COMPLETE)	VD-036 board IC4403 (EEPROM)	VD-036 board IC5001 (EEPROM)	
Mechanism	Tape path adj.	●	●	●							●			
Initialization of 8, 9, A, B, C, D, 13, 18, 1A, 1B, 1C, 1D page data	Initialization of 8, 9, C, 13, 18, 1C, 1D page data										●	●		
	Initialization of A, B, D, 1A, 1B page data										●		●	
System control	Node uniqe ID No. input										●	●		
Servo, RF	CAP FG duty adj.	●		●							●	●		●
	Switching position adj.	●	●	●							●	●		●
	Error rate check	●	●	●	●		●			●	●	●		●
Video	Origin oscillation check										●	●		
	S VIDEO OUT Y level adj.					●		●			●	●		
	S VIDEO OUT chroma level adj.					●		●			●	●		
	COMPONENT OUT adj. (D1 SMPTE)					●			●		●	●		
	COMPONENT OUT adj. (D1 BETACAM)					●			●		●	●		

Table 6-1-1

1-2. List of service tools

- Oscilloscope
- Digital voltmeter
- Audio generator
- Color monitor
- Frequency counter
- Audio attenuator
- Pattern generator
- Audio level meter

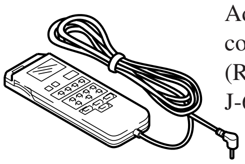
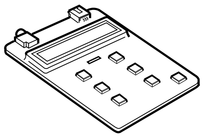
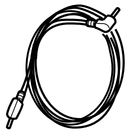
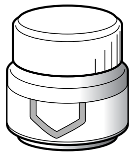
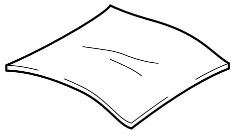
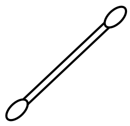
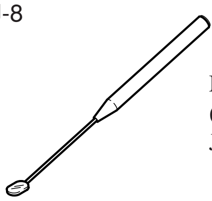
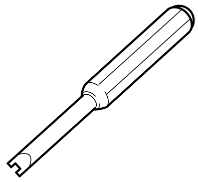
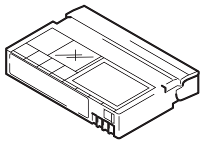
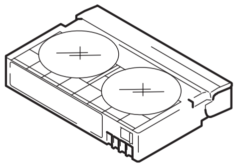
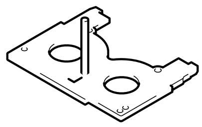
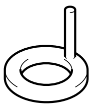
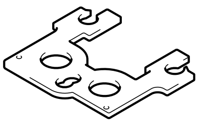
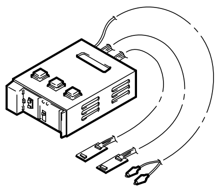
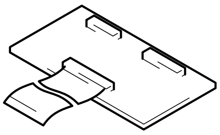
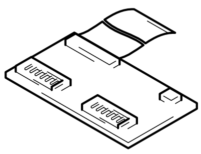
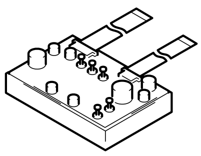
J-1  Adjustment remote commander (RM-95) J-6082-053-B	J-2  Adjustment remote commander (NEW LANC JIG) J-6082-565-A	J-3  LANC cable J-6082-442-A
J-4  Cleaning fluid 9-919-573-01	J-5  Grease (SUNCALL FG-87HSR) 7-640-006-08	J-6  Wiping cloth 7-741-900-53
J-7  Super fine applicator	J-8  Mirror (Small oval type) J-6080-840-A	J-9  Screwdraiver for the tape path J-6082-026-A
J-10  Tracking tape (XH2-1A1) 8-967-999-03	J-11  Mini DV torque cassette J-6082-360-A	J-12  Cassette reference plate J-6082-330-A
J-13  Reel reference plate J-6082-331-A	J-14  TG 2/7 preset plate J-6082-459-A	J-15  Mode Selector II J-6082-282-B
J-16  Relay board for tension regulator adjustment J-6082-461-A	J-17  Mode selector conversion board J-6082-460-A	J-18  Board for tension regulator adjustment J-6082-359-A

Fig. 6-1-1 (1)

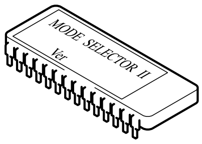
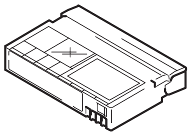
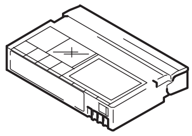
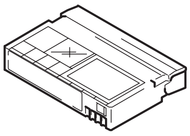
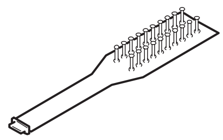
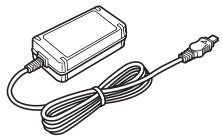
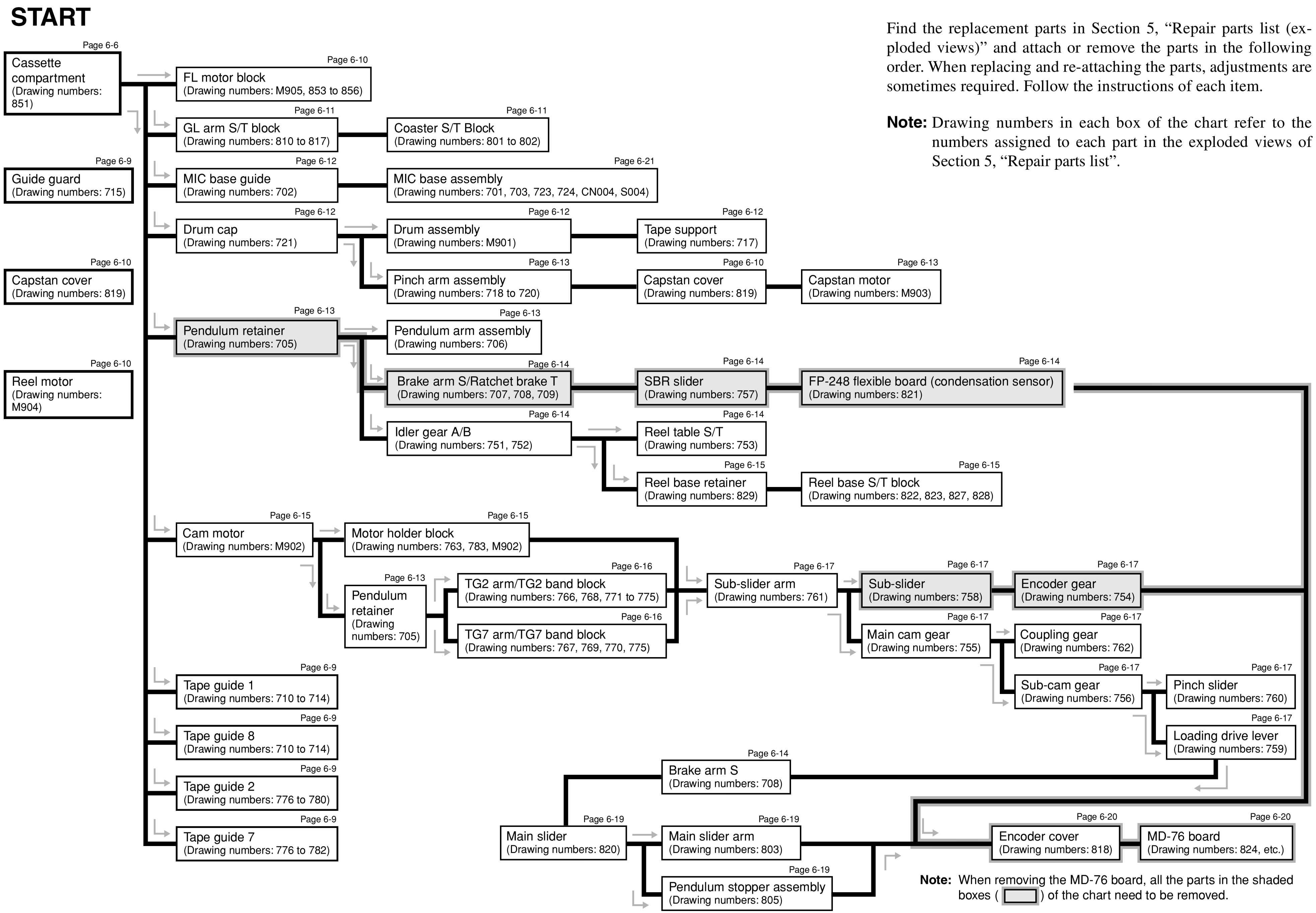
J-19	J-20	J-21
 ROM for Mode selector (Cope with R mechanism) (Note) J-6082-314-E	 SW/OL standard (XH2-3) 8-967-997-11	 Audio operation check for NTSC (XH5-3) 8-967-997-51 for PAL (XH5-3P) 8-967-997-55
J-22	**J-23**	**J-24**
 System operation check for NTSC (XH5-5) 8-967-997-61 for PAL (XH5-5P) 8-967-997-66	 CPC-8 jig J-6082-388-A	 AC power adaptor AC-L15A 1-479-283-13

Fig. 6-1-1 (2)

Note: The ROM makes mode selector II's version up to use it with R mechanism.

Find the replacement parts in Section 5, "Repair parts list (exploded views)" and attach or remove the parts in the following order. When replacing and re-attaching the parts, adjustments are sometimes required. Follow the instructions of each item.

Note: Drawing numbers in each box of the chart refer to the numbers assigned to each part in the exploded views of Section 5, "Repair parts list".



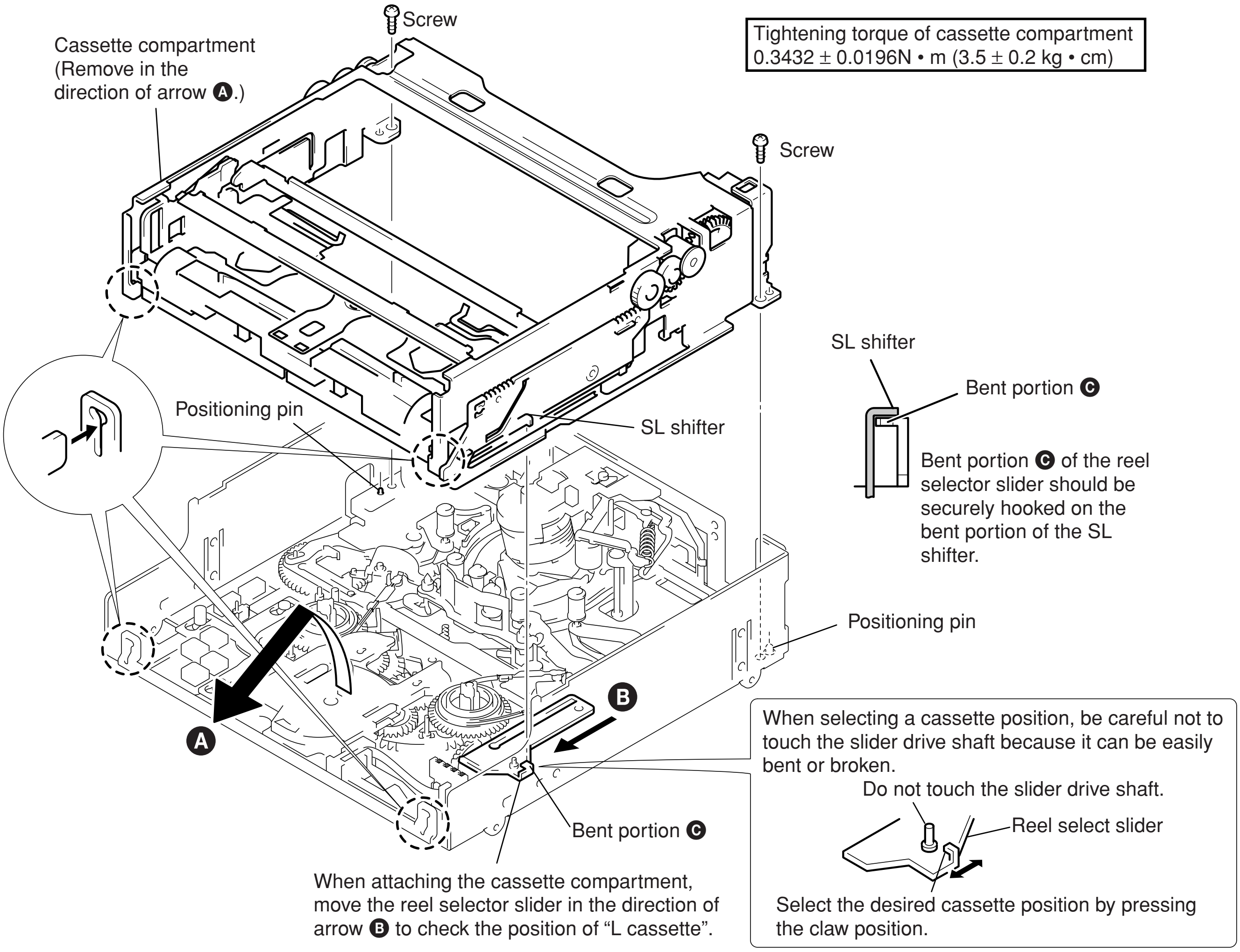
Note: When removing the MD-76 board, all the parts in the shaded boxes ( ) of the chart need to be removed.

6-1. MECHANICAL SECTION ADJUSTMENTS

6-1-1. PARTS REPLACEMENT AND PREPARATION FOR ADJUSTMENT

1-1. ASSEMBLY/DISASSEMBLY OF CASSETTE COMPARTMENT

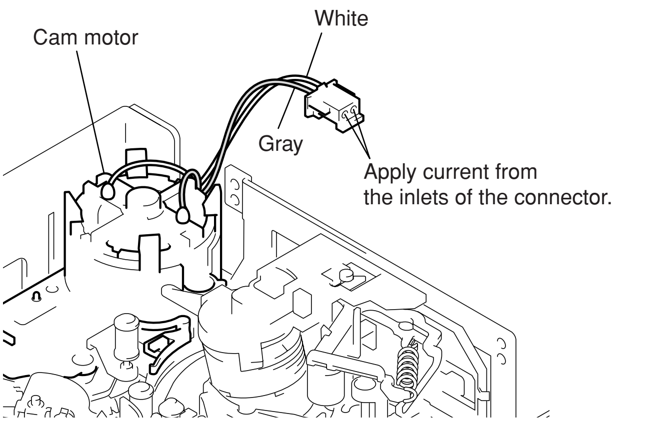
For details on disassembling the mechanism deck (R mechanism), refer to the Service Manual of the main unit in which the R mechanism is mounted.
Before attaching or removing the cassette compartment, check the position of "L cassette".



1-2. HOW TO LOAD/UNLOAD

[Using the regulated power supply]

Note: Make sure to remove the connector of the cam motor from the board of the main unit and apply +5V current.

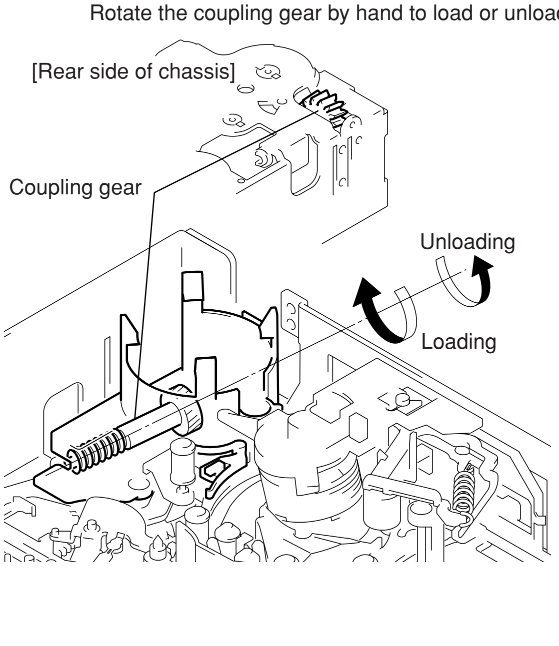


Loading : Apply positive polarity (+) of power supply to the gray wire and negative polarity (–) of power supply to the white wire.
Unloading : Apply negative polarity (–) of power supply to the gray wire and positive polarity (+) of power supply to the white wire.

[Manual: No cam motor]

Note: Remove the cam motor from the motor holder while referring to "Information" on page 6-5.

Rotate the coupling gear by hand to load or unload.



1-3. About Mode Selector II

• About Mode Selector II

3-1. OUTLINE

This unit is a mechanism drive tool which supplements the maintenance of each mechanism deck. Its functions are described below.

1. Manual test
A mode which drives the motor only while the switch is ON. It enables the operator to control the motor as desired.

2. Step test
A mode which drives the motor until the current condition detected by the sensor changes to another condition. It enables the movements made by the motor in each operation to be controlled while being detected.

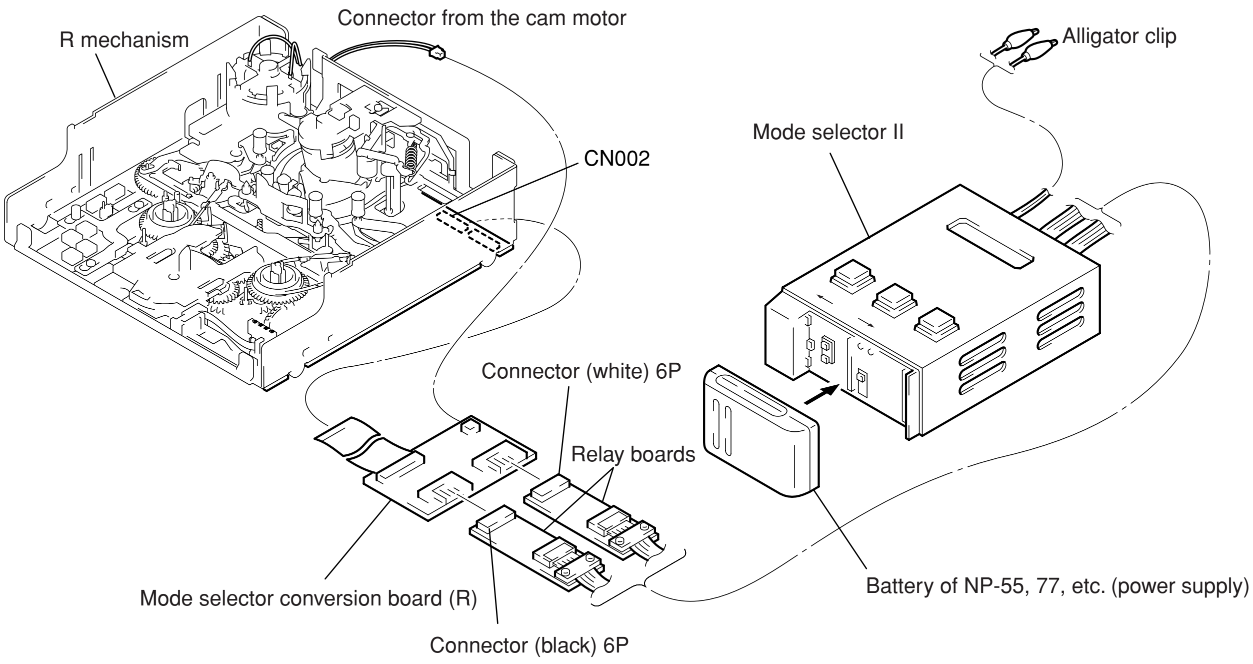
3. Auto test
A mode that checks if the mechanism operates normally according to the condition shift table recorded in the unit for each mechanism deck. All the conditions of the decks are checked through a series of operations.
An error message is displayed and operations are stopped if incorrect shifts and conditions are detected.

3-2. MECHANISM CONDITION (POSITION) SHIFTING ORDER LIST

After selecting the mechanism deck, select one of the two test modes other than the auto test, and press the RVS or FF button to specify the mechanism state (position).

Code \ MD name					R mechanism
A	**B**	**C**	**D**		
0	1	1	1	1	ULE
0	0	1	1	2	DEW
1	0	1	1	3	LE
1	0	0	1	4	REW
1	0	1	0	5	FF
1	1	1	0	6	STOP
1	1	0	1	7	FWD / RVS

3-3. MODE SELECTOR II CONNECTION



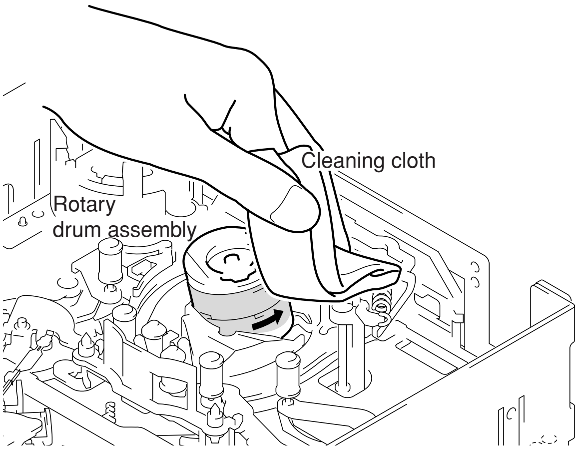
6-1-2. PERIODIC CHECK

- Carry out the following maintenance and periodic checks not only to fully display the functions and performance of the set, but also for the equipment and tape. After replacing, service the set as follows, regardless of the length of use.

2-1. CLEANING OF ROTARY DRUM ASSEMBLY

1. Press a wiping cloth (J-6) moistened with cleaning fluid (J-4) against the rotary drum assembly gently, and clean it while rotating the rotary drum assembly slowly with your finger in the counterclockwise direction.

Note: Do not rotate the motor on power or rotate the rotary drum assembly in the clockwise direction with your finger. The head tip will also be damaged if the wiping cloth is moved perpendicularly against it. Therefore, be sure to follow the above instructions when cleaning the rotary drum assembly.

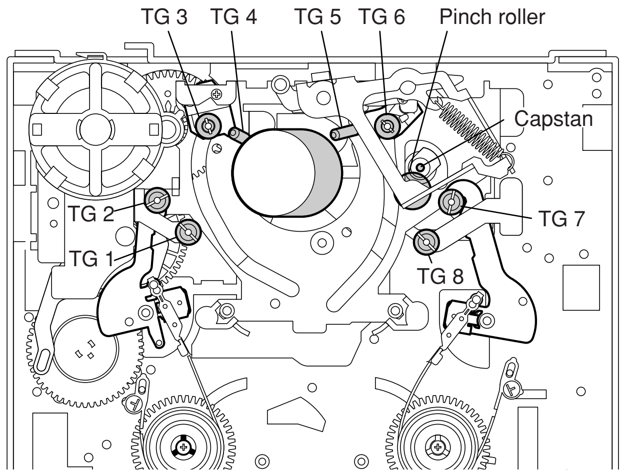


2-2. CLEANING OF TAPE PATH SYSTEM

1. Clean the tape path systems (TG1 to TG8 and capstan) and the lower drum using a super fine applicator (J-7) moistened with cleaning fluid.

Note: Make sure that no oil or grease of the link mechanisms sticks to the super fine applicator (J-7).

Note: Do not use a applicator moistened with alcohol to the other guide cleaning. But clean the pinch roller using alcohol.



2-3. PERIODIC CHECKS

Location of Maintenance and Check		Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of the oil.
	Cleaning and degaussing of rotary drum assembly	○	○	○	○	○	○	○	○	○	○	Be careful of the oil.
Driving System	Gear	—	◎	—	◎	—	◎	—	◎	—	◎	Make sure that no oil gets on the tape path surface.
	Cam motor (worm block)	—	◎	—	◎	—	◎	—	◎	—	◎	X-3946-702-1 (M902)
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD/RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎: Appling grease ☆: Confirmation

Note: When overhauling, refer to the checks above and replace parts.

Note: Greasing
Always use the specified grease (SUNCALL FG-87HSR Part No. 7-640-006-08). If the viscosity differs, various problems may occur.

6-1-3. PARTS REPLACEMENT

• Precaution

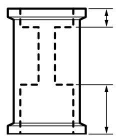
For details on disassembling the cabinets, boards and other parts, refer to “Section 2, Disassembly”. For details on replacing parts (disassembly, assembly) of the mechanism deck, refer to “Information” on page 6-5.

3-1. TAPE GUIDE 1/8 AND GUIDE GUARD

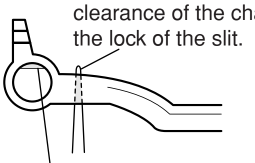
Disassembly/Assembly

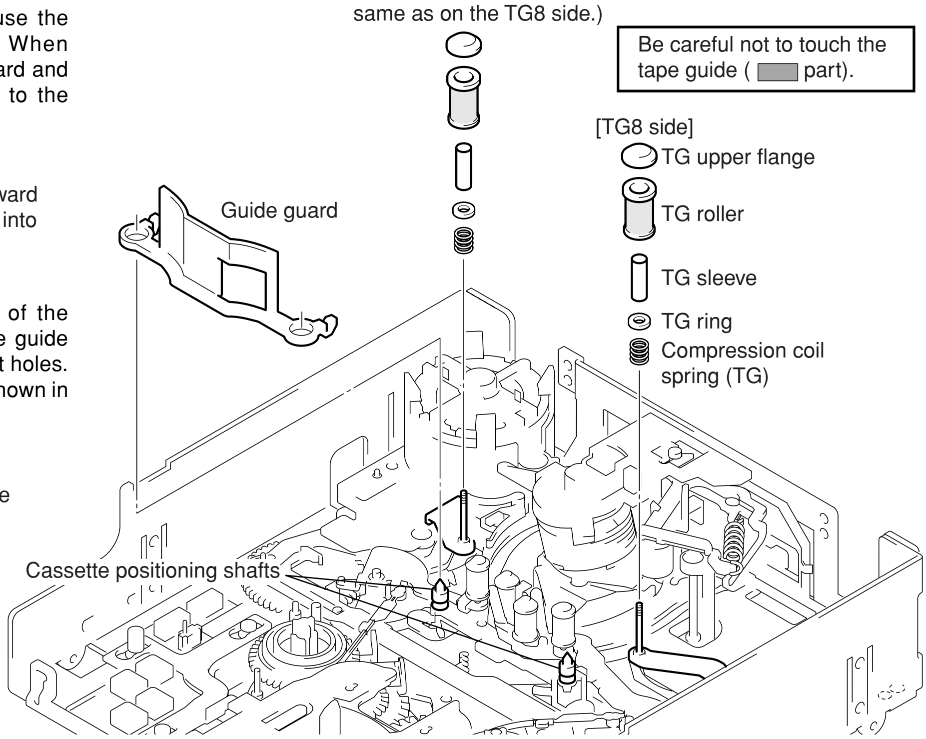
When the tape guide 1/8 is replaced or attached, perform each adjustment from Adjustment Start -2 of the flowchart on page 6-23.

To attach or remove the tape guide, use the screwdriver for the tape path (J-9). When attaching the TG rollers, check the upward and downward directions and attach them to the chassis shaft.



The guide guard is fixed at each slit of the cassette positioning shaft. To attach the guide guard, only insert it into the right and left holes. To remove it, use a pair of tweezers as shown in the figure below.



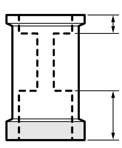


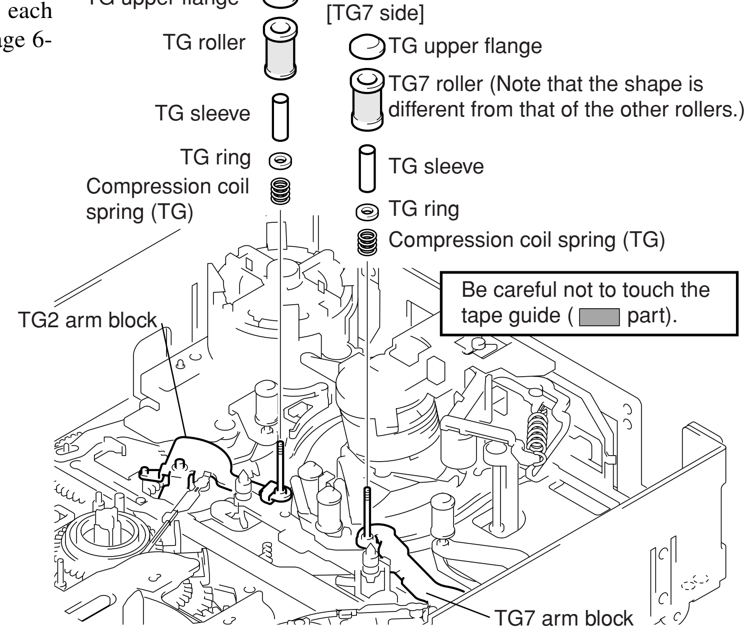
3-2. TAPE GUIDE 2/7

Disassembly/Assembly

When the tape guide 2/7 is replaced or attached, perform each adjustment from Adjustment Start -3 of the flowchart on page 6-23.

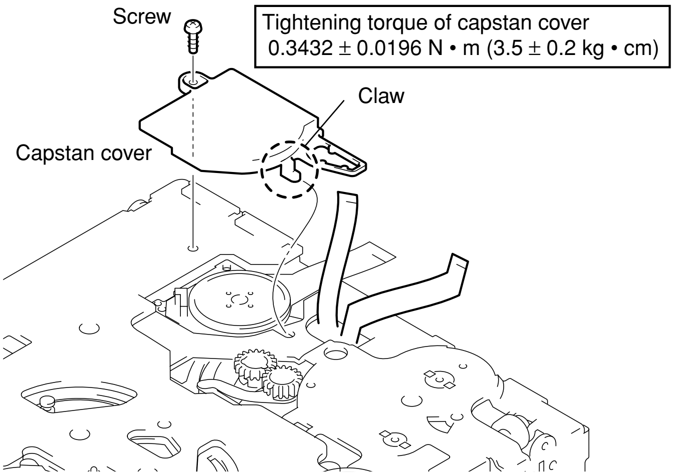
To attach or remove the tape guide, use the screwdriver for the tape path (J-9). When attaching the TG rollers, check the upward and downward directions and that the TG roller to be attached to the TG7 side is exclusively for the TG7 side. Then attach the TG rollers to the chassis shaft.

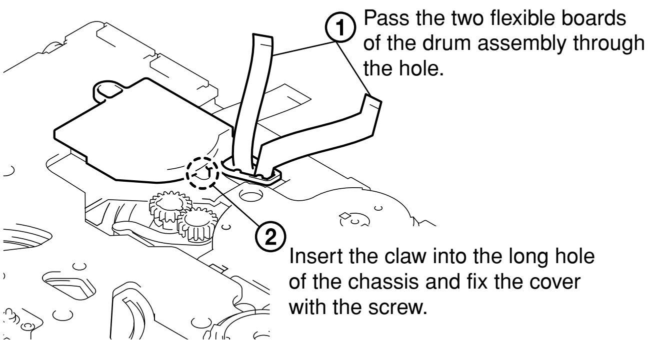




3-3. CAPSTAN COVER

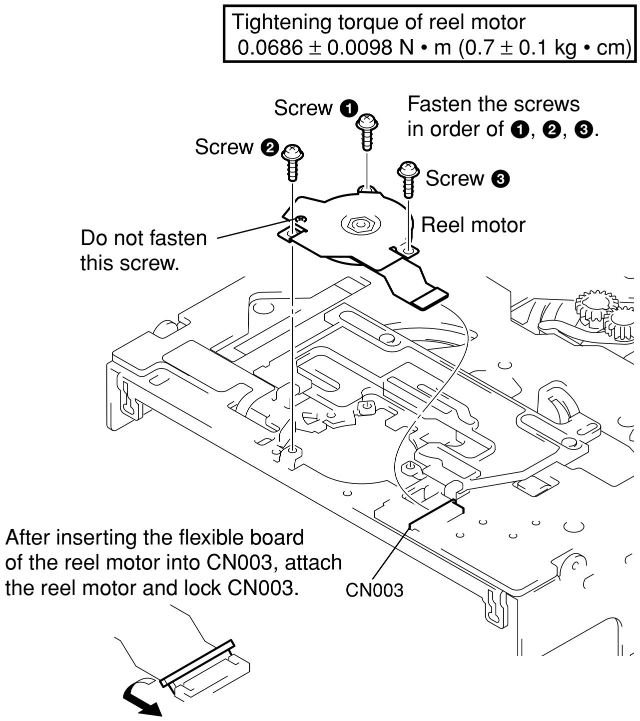
Disassembly/Assembly





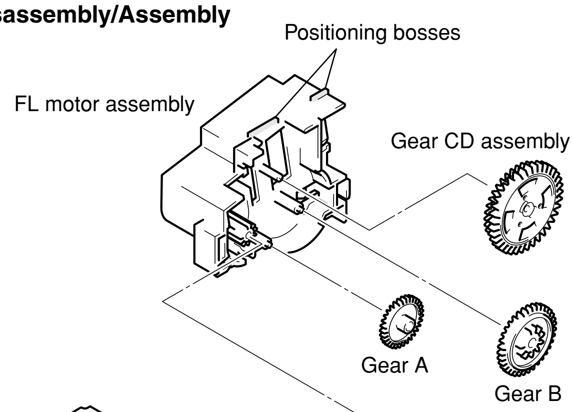
3-4. REEL MOTOR

Disassembly/Assembly

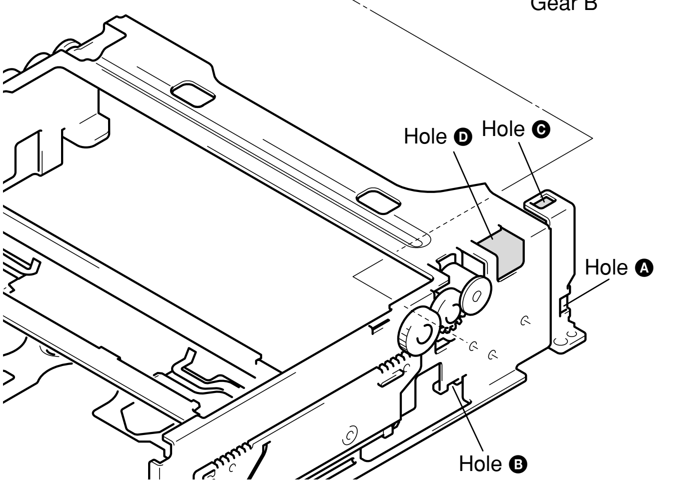


3-5. FL MOTOR ASSEMBLY, GEAR A, GEAR B AND GEAR CD ASSEMBLY

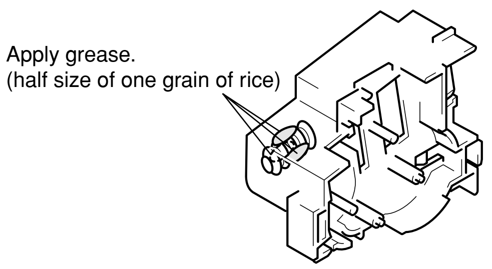
Disassembly/Assembly



Remove the claws of the FL motor assembly from hole Ⓐ and hole Ⓑ and remove the FL motor assembly. Then, remove each gear, etc.
To attach them, after attaching the gears, etc. to the FL motor assembly and hook the positioning bosses of the FL motor block on holes Ⓒ and Ⓓ then fit the two claws in each hole Ⓐ and Ⓑ.



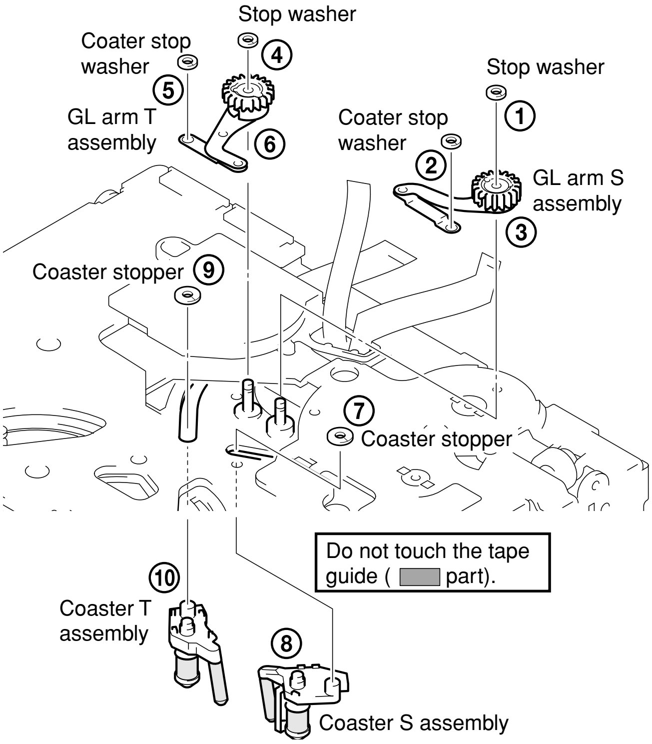
The worm gears are attached inside the FL motor assembly. When attaching the FL motor assembly, apply grease there.



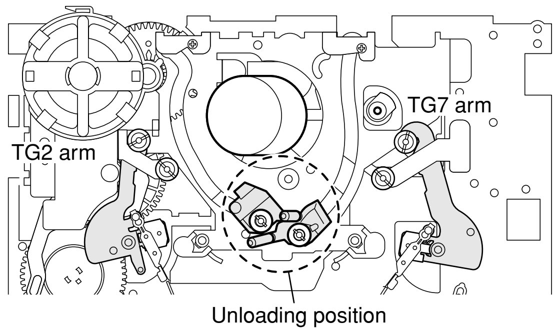
3-6. GL ARM S ASSEMBLY, GL ARM T ASSEMBLY, COASTER S ASSEMBLY AND COASTER T ASSEMBLY

Disassembly: Remove the parts in order of ①➡②➡③➡④➡⑤➡⑥➡⑦➡⑧➡⑨➡⑩

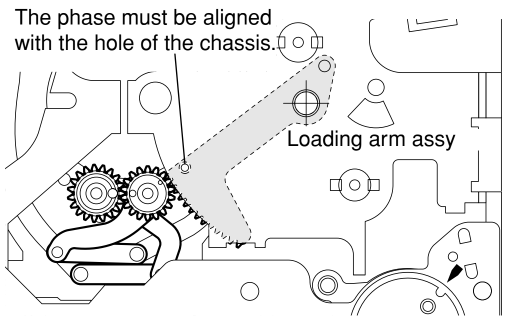
For the disassembling and assembling procedures of the GL gear, GL helical torsion spring, etc., refer to page 6-21.



Move the TG2/7 arms to the loading position with the regulated power supply or by hand while referring to page 6-6. Each coaster assembly must be in the unloading position.

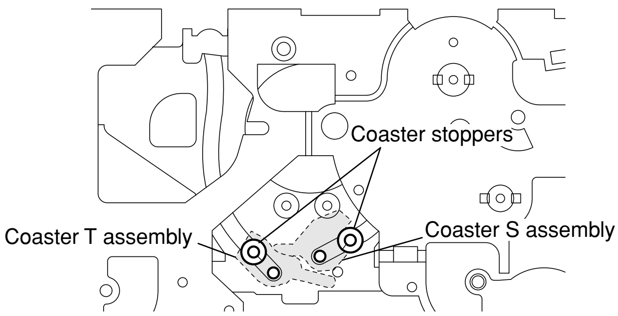


With consideration for future assembly, check from the rear of the chassis that the phase of the loading arm assy is aligned.

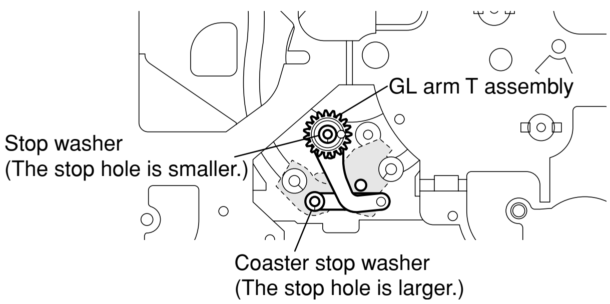


Assembly

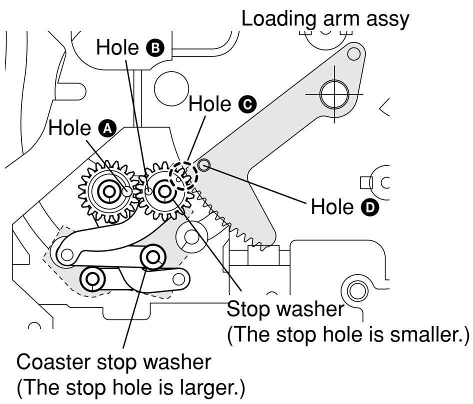
① Attach the coaster S/T assembly to the chassis with a new coaster stopper while being careful not to touch the tape guide. Do the work while holding the drum side of each coaster.



② Attach the GL arm T assembly. Fix the stop washers in the correct position, using new stop washers.



③ Attach the GL arm S assembly while checking the phase of each part. Fix the stop washers at the correct position, using new stop washers.

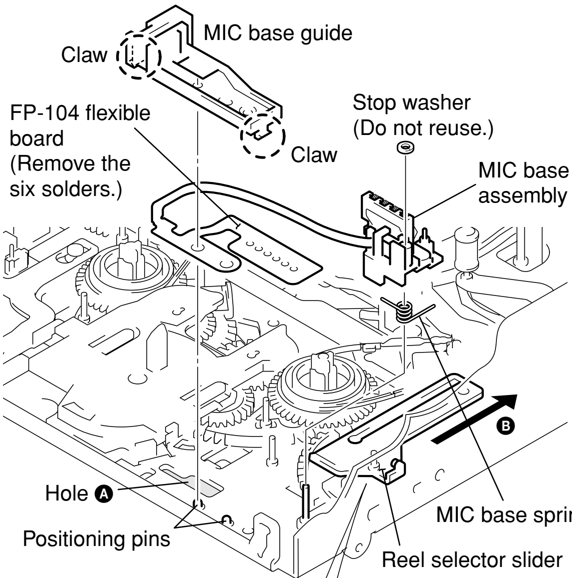


Check each phase adjustment while referring to the above figure.
Hole Ⓐ of the GL gear T and hole Ⓑ of the GL gear S must face each other. Hole Ⓓ of the loading arm assy must be aligned with the hole of the chassis, and the endmost gear tooth of the loading arm assy must face toward hole Ⓒ of the GL gear S.

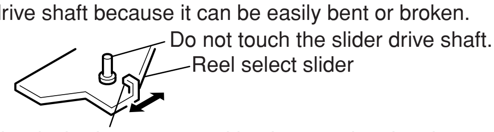
3-7. MIC BASE GUIDE, MIC BASE ASSEMBLY AND MIC BASE SPRING

Disassembly/Assembly

For the disassembling and assembling procedures of the components of the MIC base assembly, refer to page 6-21.



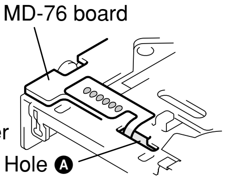
When selecting a cassette position, be careful not to touch the slider drive shaft because it can be easily bent or broken.



Select the desired cassette position by pressing the claw position.

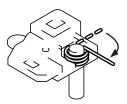
Remove the six solders on the FP-104 flexible board from the rear of the chassis. Pass the flexible board through hole A and pull it out of the front side of the chassis while being careful not to damage it. To attach the flexible board, perform the steps of disassembly in reverse order.

Six solders
Temperature of tip of soldering iron : 350 ± 20 °C
Hold time : one second or shorter

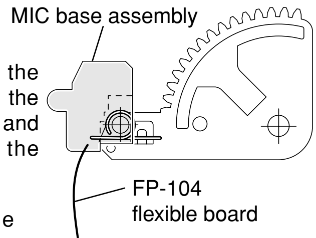


Move the reel selector slider in the direction of arrow B and attach the MIC base assembly at the position of "S cassette". For the assembly of the MIC base spring, refer to the figure.

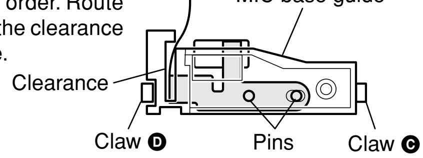
Note: Do not hold the shaft when selecting the reels.



Insert the side of the shorter spring into the hole of the holder and hook the side of the longer spring.



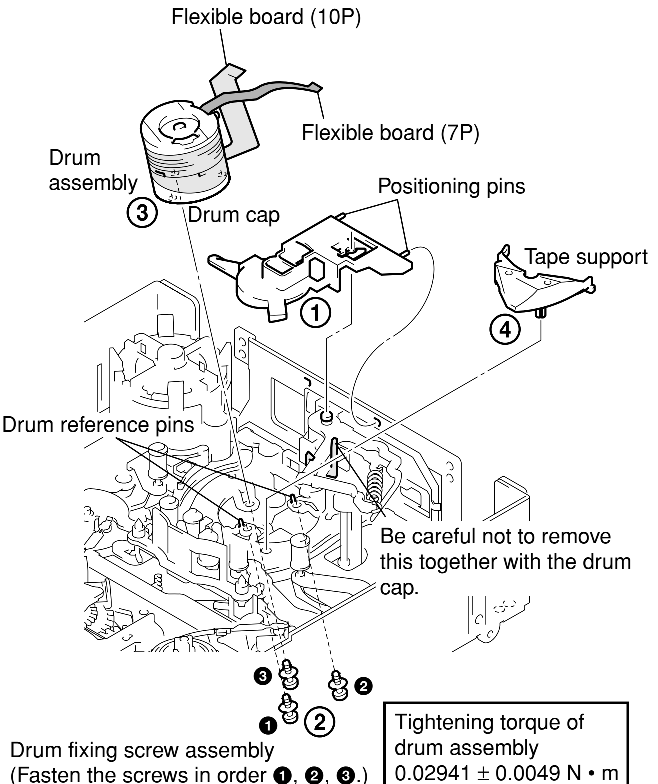
When attaching the MIC base guide, lock the positioning pins, claw C, and claw D in this order. Route the flexible board into the clearance of the MIC base guide.



3-8. DRUM CAP, DRUM ASSEMBLY AND TAPE SUPPORT

Disassembly: Remove them in order of ①➡②➡③

For the disassembly and assembly procedures of the components of the drum assembly, refer to page 6-22.



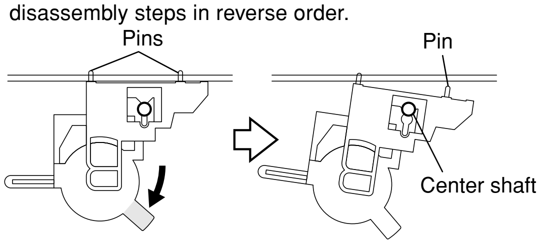
Tightening torque of drum assembly
0.02941 ± 0.0049 N • m
(0.3 ± 0.05 kg • cm)

Assembly: Attach the parts while referring to the disassembly procedure and the figure below.

(After assembling, adjust the tape path while referring to page 6-23 and thereafter.)

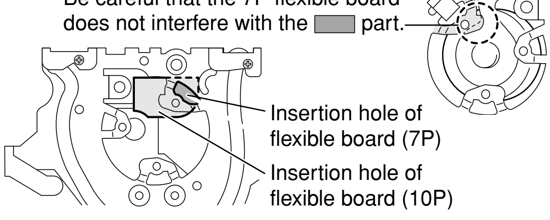
Assembly and disassembly of the drum assembly

When pulling the [shaded] part in the direction of the arrow, the claw is removed from the center shaft, then the right pin and the drum cap are removed as shown in the figure on the right. To attach the drum assembly, perform the disassembly steps in reverse order.

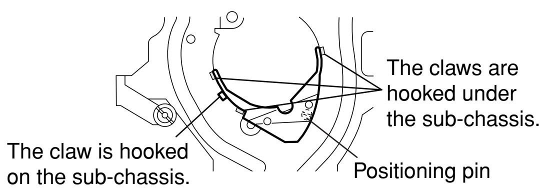


Assembly and disassembly of the drum assembly

Be careful that the 7P flexible board does not interfere with the [shaded] part.



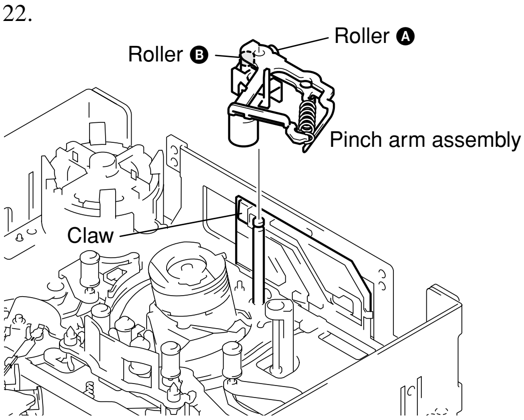
Assembly and disassembly of the tape support



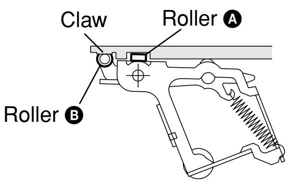
3-9. PINCH ARM ASSEMBLY

Disassembly/Assembly

For the disassembling and assembling procedures of the tape retainer and compression coil spring (tape retainer), refer to page 6-22.



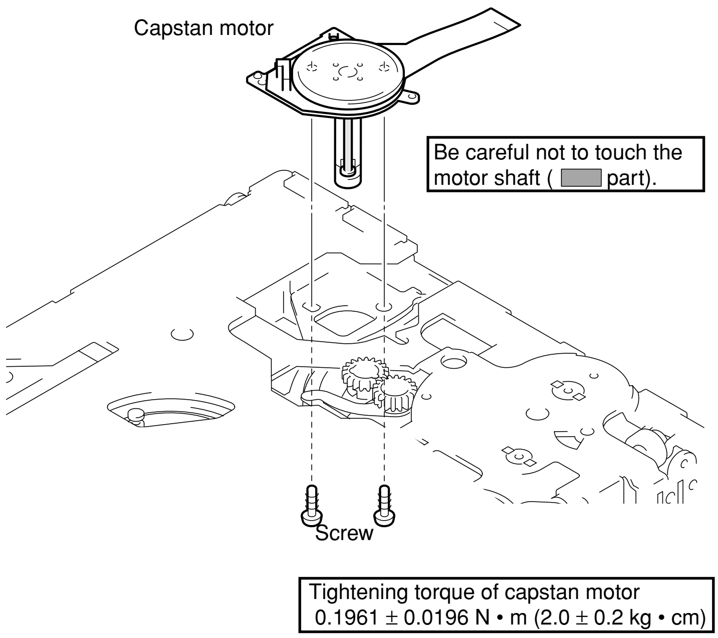
Push roller (A) into the groove as shown in the figure. Insert roller (B) into the claw. To remove the pinch arm assembly, pull out the pinch arm upward while pushing the claw.



3-10. CAPSTAN MOTOR

Disassembly/Assembly

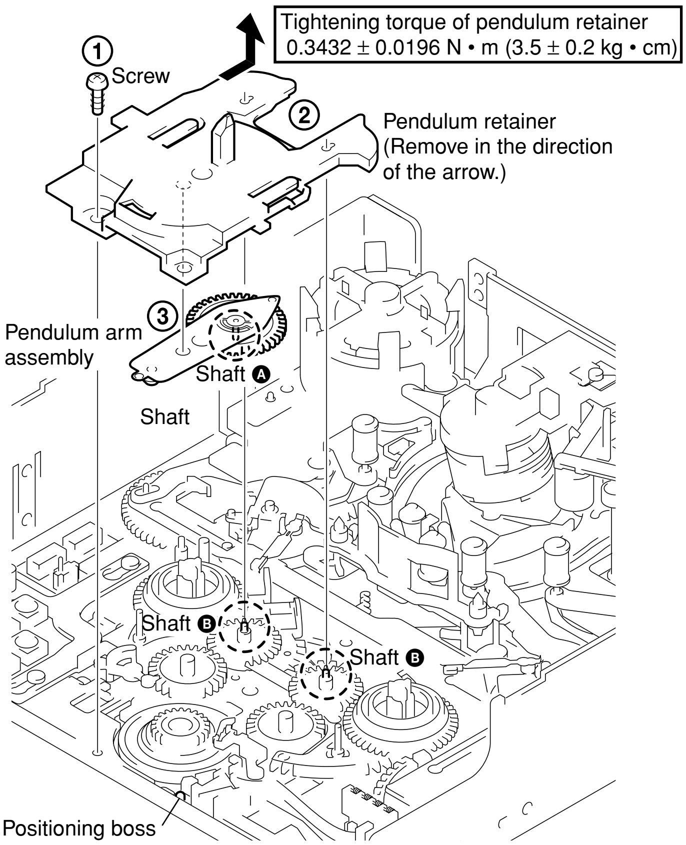
(After assembling, adjust the tape path from page 6-23.)



3-11. PENDULUM RETAINER AND PENDULUM ARM ASSEMBLY

Disassembly: Remove them in order of ①➡②➡③

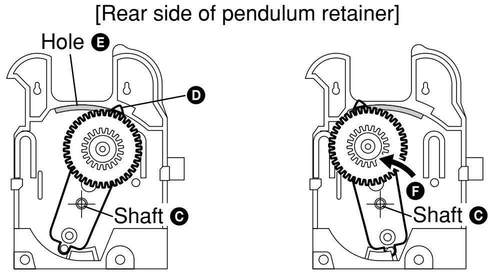
(To attach them, perform the disassembly steps in reverse order.)



Notes during assembly

When assembling or disassembling the pendulum arm assembly, be careful of the following.

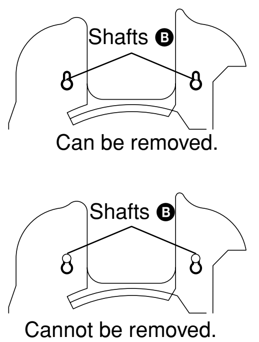
[Rear side of pendulum retainer]

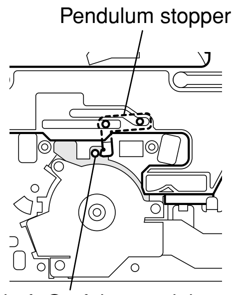


Insert tip (D) of the pendulum arm into hole (E) of the pendulum retainer and insert the pendulum into shaft (C).

Slide the pendulum arm in the direction of arrow (F) and attach it to the chassis.

Attach the pendulum retainer to shaft (B). Be careful of the positions of the pendulum stopper at the rear of the chassis and shaft (A) of the pendulum arm.



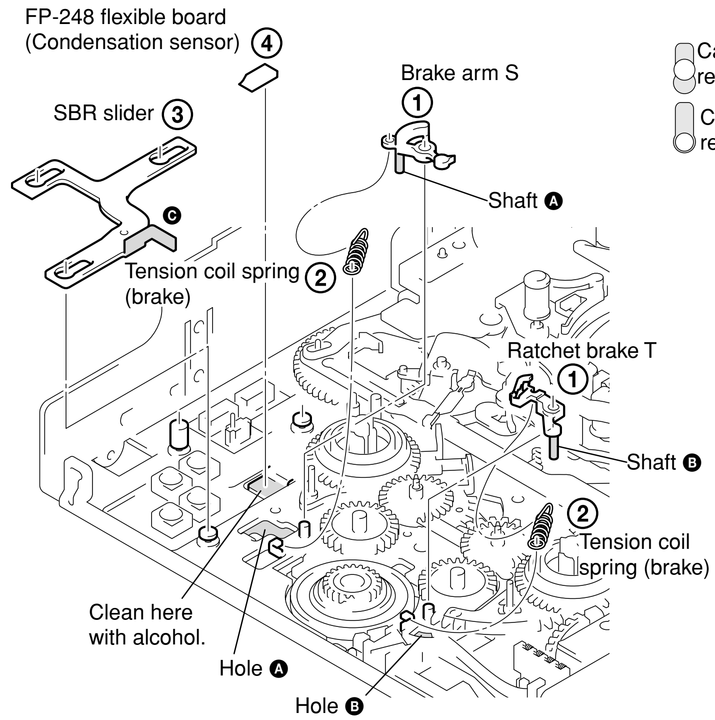


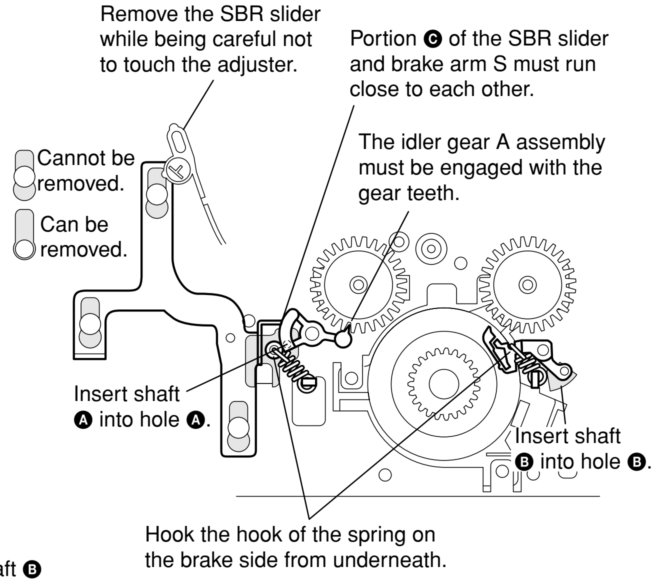
Shaft (A) of the pendulum must be in this position.

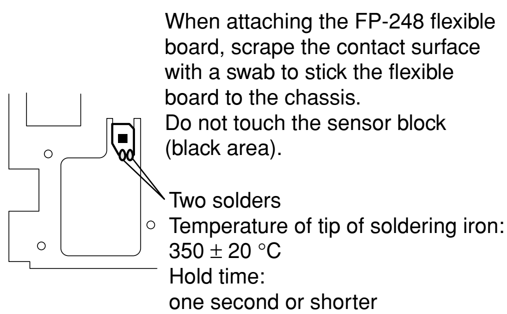
3-12. BRAKE ARM S, RATCHET BRAKE T, TENSION COIL SPRING (BRAKE), SBR SLIDER AND FP-248 FLEXIBLE BOARD (CONDENSATION SENSOR)

Disassembly: Remove them in order of ①➡②➡③➡④

(To attach them, perform the disassembly steps in reverse order.)



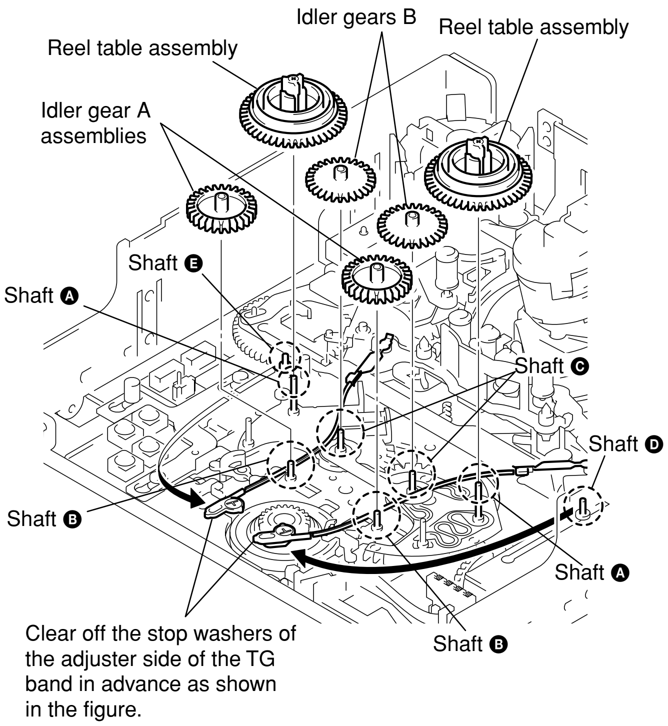




3-13. REEL TABLE ASSEMBLY, IDLER GEAR A ASSEMBLY AND IDLER GEAR B

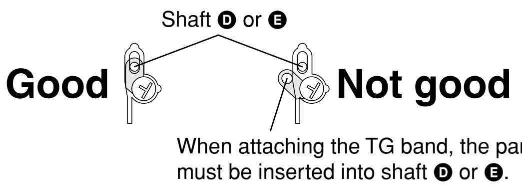
Disassembly/Assembly
(Do not touch the TG band block.)

When the reel table assembly is replaced or attached, perform each adjustment from Adjustment Start -1 of the flowchart on page 6-23.

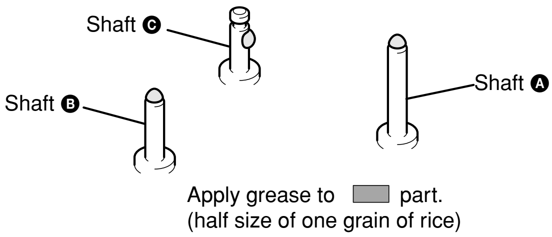


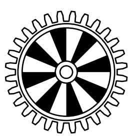
Checks before work

The TG band winds around the slit of the reel table assembly. Before removing the reel table assembly, clear off the TG band while referring to the left figure. When attaching the TG band, be sure to use new stop washers.



When attaching each gear, apply grease to each fixing shaft. Apply grease of half the size of one rice grain to the top side of shaft Ⓒ. When attaching the idler gear A assembly, be careful not to apply grease to the reflection panel.



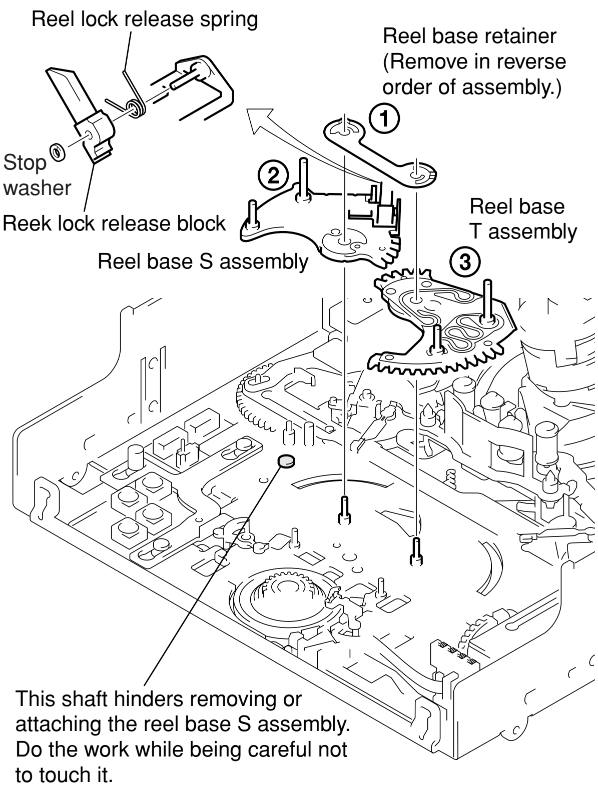


When attaching the idler gear A assembly, be careful not to apply grease to the reflection panel.

3-14. REEL BASE RETAINER, REEL BASE T ASSEMBLY AND REEL BASE S ASSEMBLY (REEL LOCK RELEASE BLOCK AND REEL LOCK RELEASE SPRING)

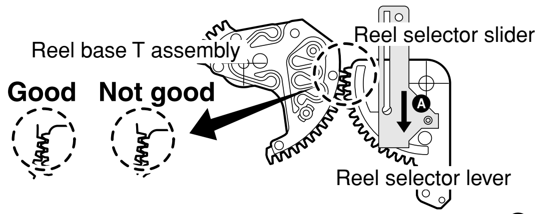
Disassembly: Remove them in order of ①➡②➡③

(Refer to Assembly, too.)

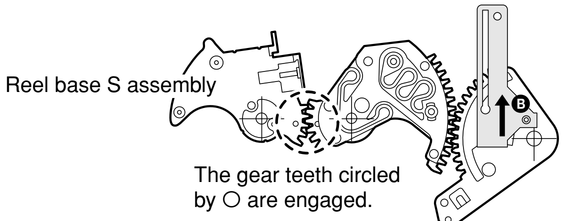


Assembly: Attach them in order of ①➡②➡③

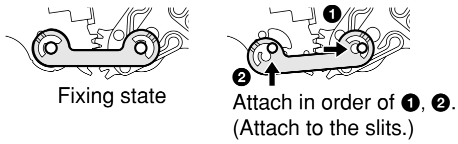
① Move the reel selector slider in the direction of arrow Ⓐ to check that the reel selector lever is "L cassette". At this position, attach the reel base T assembly. The gear teeth must be engaged as shown in the figure.



② Move the reel selector slider in the direction of arrow Ⓑ and switch the reel selector lever to "S cassette". At this position, attach the reel base S assembly. The gear teeth (circled by ○) must be engaged as shown in the figure.



③ Attach the reel base retainer.

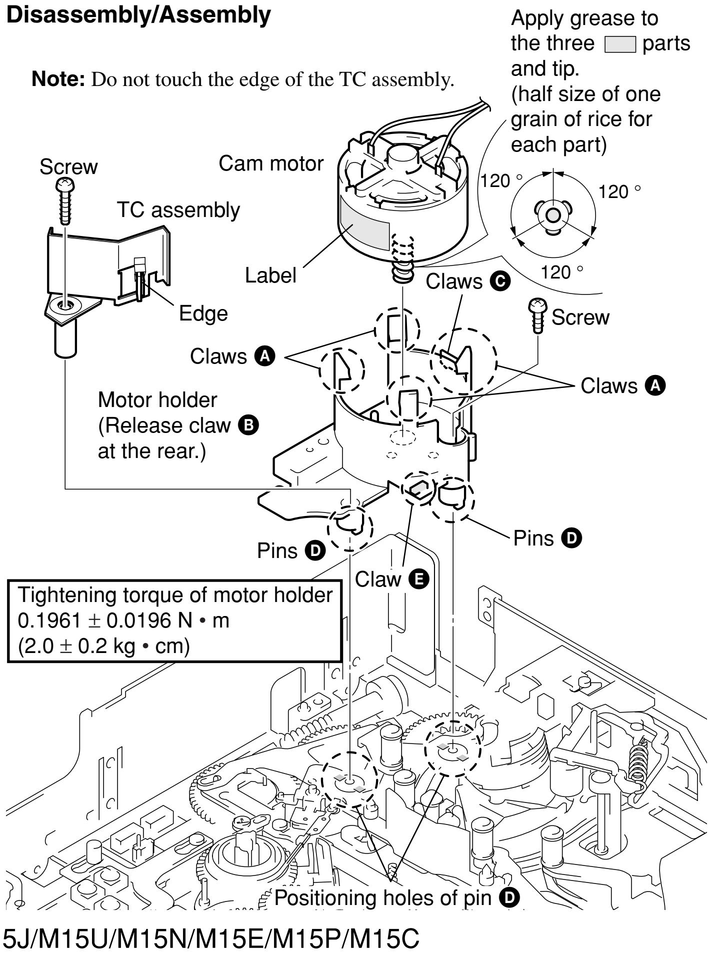


Note: Do not hold the shaft when selecting the reels.

3-15. CAM MOTOR, MOTOR HOLDER

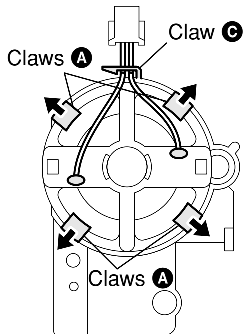
Disassembly/Assembly

Note: Do not touch the edge of the TC assembly.



Checks before disassembly and assembly

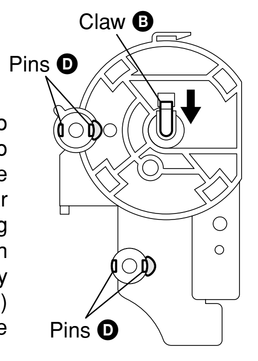
The cam motor is fixed on the motor holder by the four claws. Releasing the four claws enables the cam motor to be removed without removing the motor holder from the chassis. When attaching the cam motor, be careful of the assembling direction (the label must face toward the front). If the phase of the gear, etc. moves when removing the motor holder, refer to page 6-11.



[Front side of motor holder]
While spreading claws Ⓐ in the direction of the arrow, pull out the cam motor upward. To attach it, push the cam motor into the motor holder and route the two wires of the cam motor into claw Ⓒ.

When attaching the TG2 control arm, claw Ⓔ must be inserted into the hole of the TG2 control arm.

[Rear side of motor holder]
The motor holder is fixed by the two screws and claw Ⓑ at the rear. To remove it, push claw Ⓑ in the direction of the arrow from the rear of the chassis. Note that positioning pins Ⓓ are easy to break when attaching the motor holder. Apply grease (half size of one grain of rice) to the two parts shown in the right figure.



3-16. TG2/7 ARM BLOCK, TG2/7 BAND BLOCK AND TENSION COIL SPRING (TG2)/(TG7)

Disassembly: Remove them in order of ①➡②➡③➡④

For the disassembling and assembling procedures of the assembly components of the TG2/TG7 arm, refer to page 6-22.

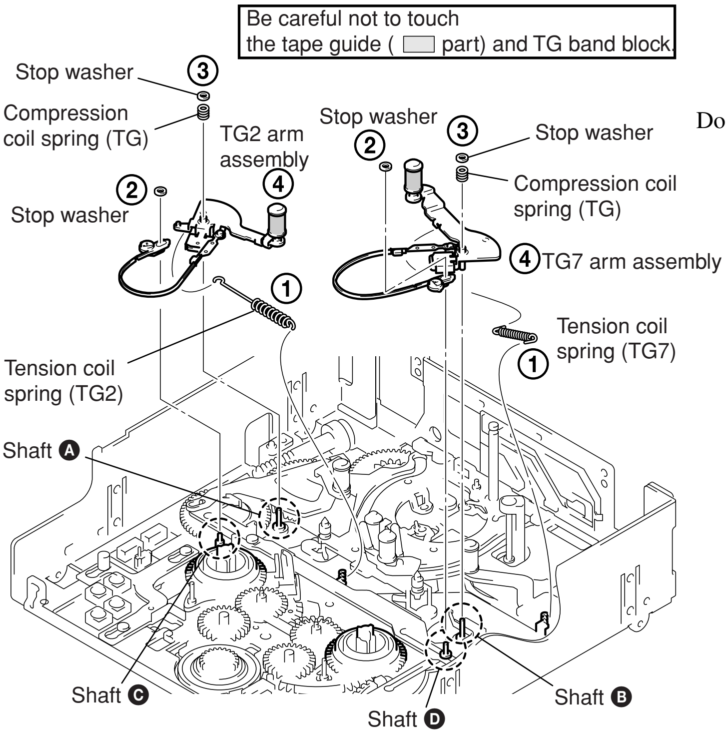


Fig. 1

Notes during work

Be careful when handling the TG arm and the peripheral parts.

- Twisting and bending of the band block and tension coil spring
- Dirt and scratches of the tape guide
- Loss of the compression coil spring (TG)

Do not reuse removed stop washers.

Disassembly of the band TG2/TG7 assembly

When pulling portion Ⓔ of the TG2 or TG7 band in the direction of the arrow, a click sound is heard as the band is removed. To attach the bands, pull out the opposite side to portion Ⓔ to lock.

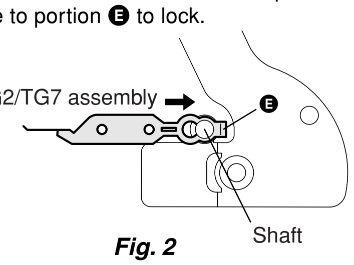


Fig. 2

Assembly: Attach them while referring to figure above or below and the descriptions.

When these parts are replaced or attached, perform each adjustment from Adjustment Start -3 of the flowchart on page 6-23.

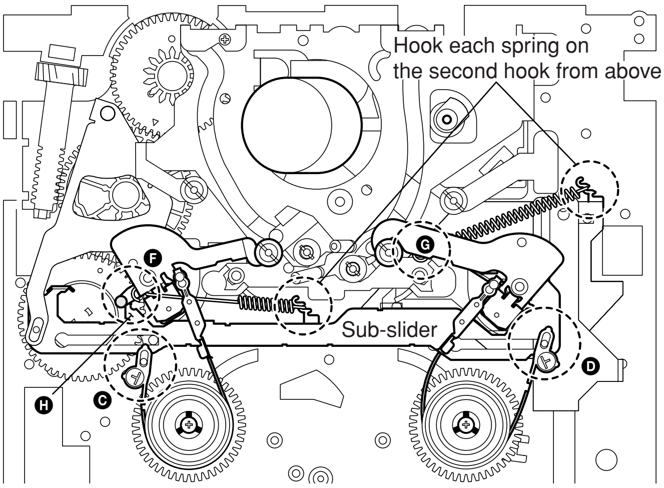


Fig. 3

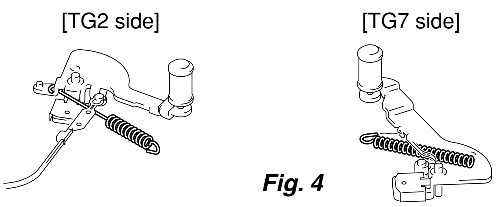
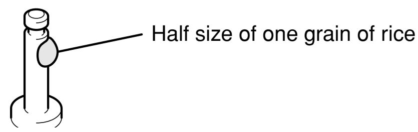


Fig. 4

Hook the spring from the inside and put it under the TG band.

Hook the spring from the outside and put it under the arm.

① Apply grease to the top side of the fixing shaft (Ⓐ or Ⓑ) of the TG arm. (Fig. 1)

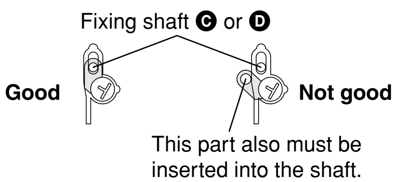


② Attach the TG band assembly to the TG arm assembly. (Fig. 2) Be sure that the felt sides of the TG band face toward the reel tables so that they surround the respective reel tables.

③ Attach the tension coil spring to the TG arm assembly. (Fig. 3, 4)
- Hook the spring of the tension coil spring (TG2) from the inside and put it under the TG band. (Fig. 3-Ⓕ, 4)
- Hook the spring of the tension coil spring (TG7) from the outside and put it under the TG7 band. (Fig. 3-Ⓖ, 4)

④ Attach the TG arm block to the shaft (Ⓐ or Ⓑ) and attach the tension coil spring to the second hook. When attaching the TG2 arm, the part must be at the left of portion Ⓗ of the slider. (Fig. 3)

⑤ Attach the adjuster of the TG band to shafts Ⓒ and Ⓓ.



⑥ Fix the TG band and TG arm with new stop washers. When attaching the TG arm, do not forget to attach the compression coil spring (TG). (Fig. 1)

3-17. SUB-SLIDER ARM, SUB-SLIDER, ENCODER GEAR, MAIN CAM GEAR, COUPLING GEAR, SUB-CAM GEAR, PINCH SLIDER AND LOADING ARM ASSY

Disassembly: Remove them in order of ①➡②➡③➡④➡⑤➡⑥➡⑦➡⑧

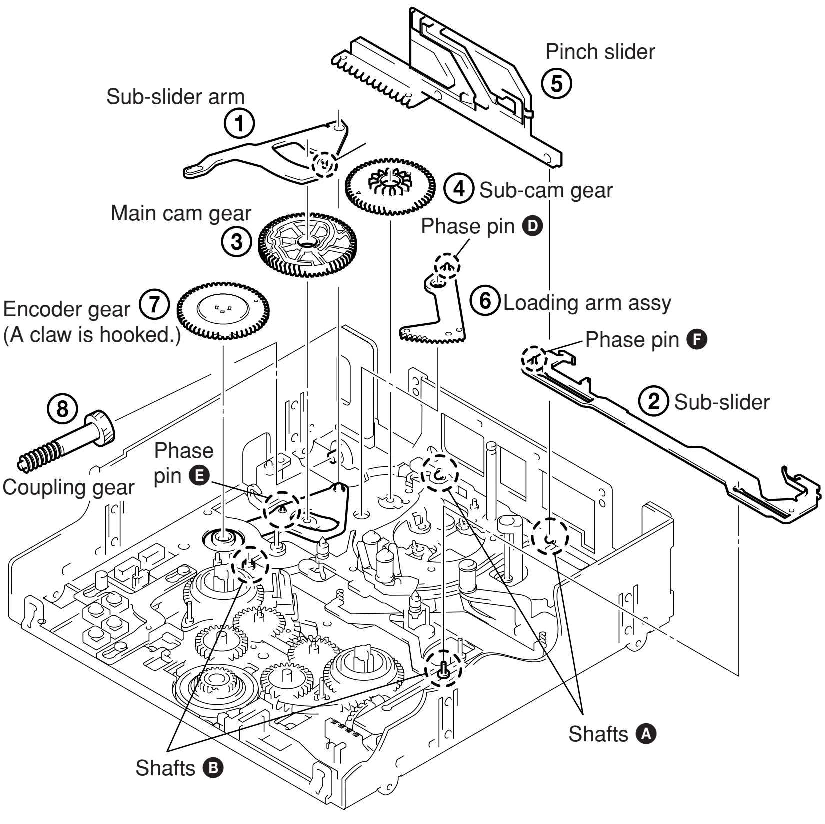


Fig. 1

Disassembly of the pinch slider

Move the pinch slider to the leftmost end, and slide it upward and remove it when two shafts A are superimposed on the holes of the pinch slider.

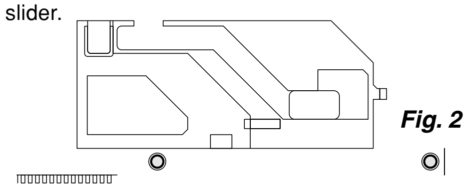


Fig. 2

Disassembly of the sub-slider

Move the sub-slider to the rightmost and remove it from two shafts B.

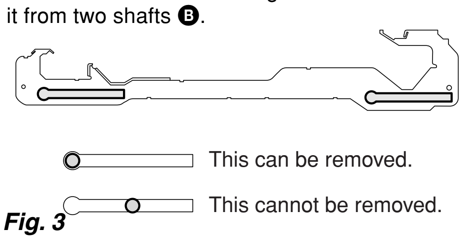


Fig. 3

Disassembly of the encoder gear

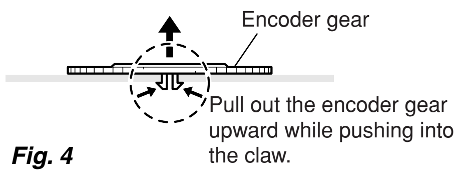


Fig. 4

Assembly: Attach them while referring to the figure above or below and the descriptions.

Check before work

When attaching the parts described in this section, various phase adjustments are required. Before work, refer to page 6-19 and check the reference phases.

[Rear side of chassis]

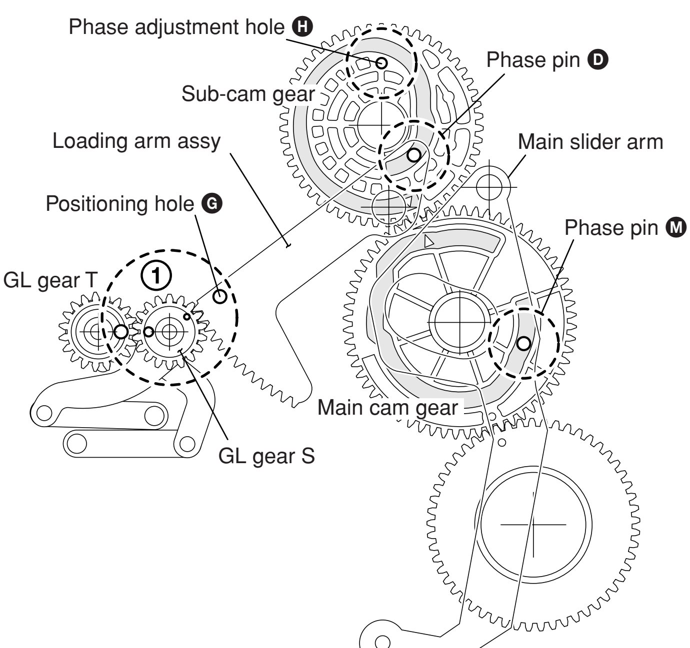


Fig. 5

① Attach the loading arm assy. (Refer to the figure above.)
The phases of the GL gear S and GL gear T must match and the positioning hole G of the loading arm assy must be superimposed on the hole of the chassis. (Fig. 5)

② Attach the pinch slider. (Fig. 1, 2)

③ Apply grease to the groove at the rear of the sub-cam gear. (Fig. 6)
After applying, adjust the phase of the sub-cam gear to that of the pinch slider. (Fig. 7)
Phase pin D of the loading arm assy must be inserted into the groove at the rear of the sub-cam gear. (Fig. 5, 7)

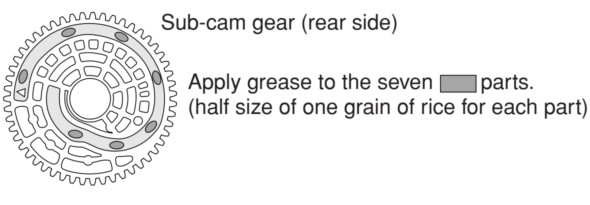


Fig. 6

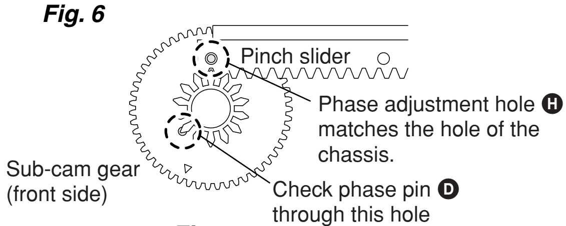


Fig. 7

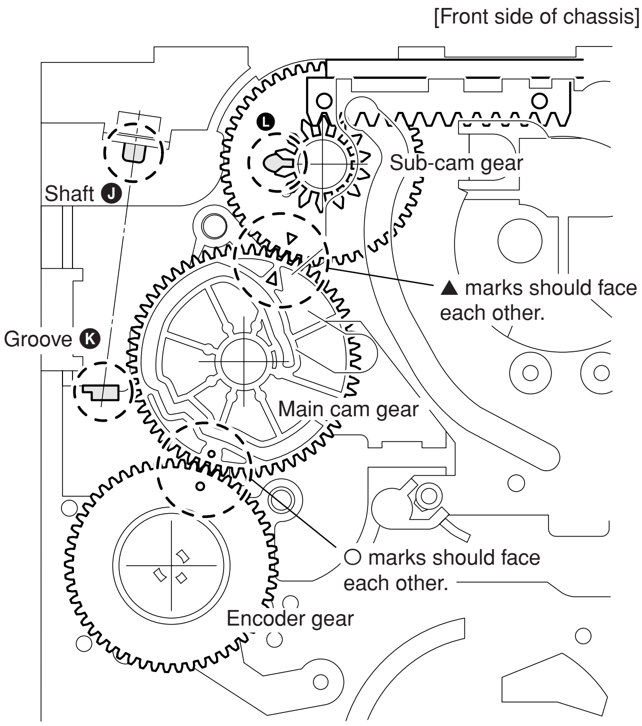


Fig. 8

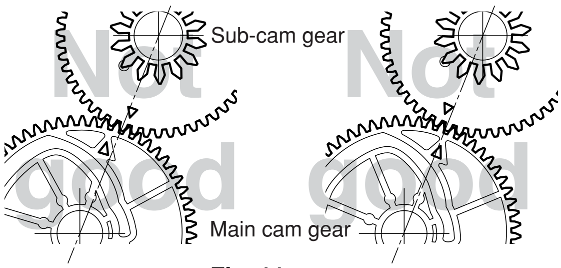


Fig. 11

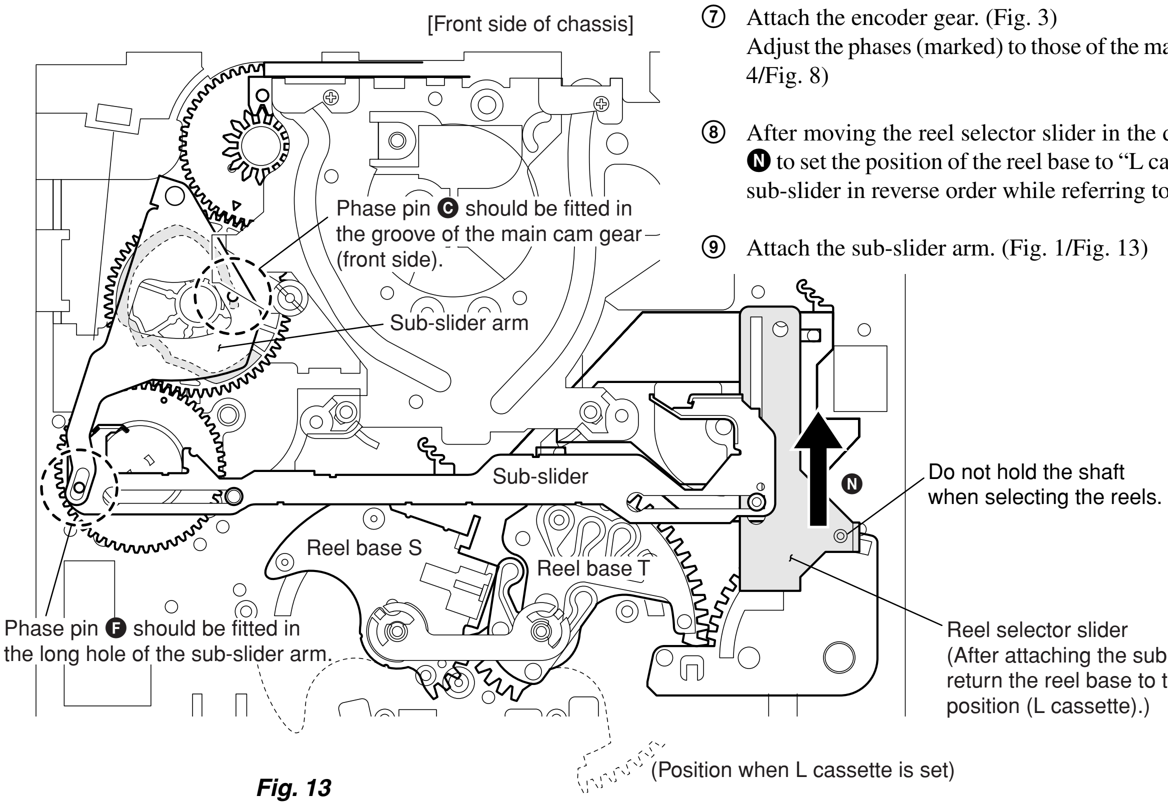


Fig. 13

④ Apply grease to the fixing block (shaft J and U-shaped groove K) of the coupling gear and portion L of the sub-cam gear (half size of one grain of rice for each part). (Fig. 8)

⑤ Attach the coupling gear. After attaching, apply grease while rotating the coupling gear by 120˚ each time. (Fig. 9, 10)

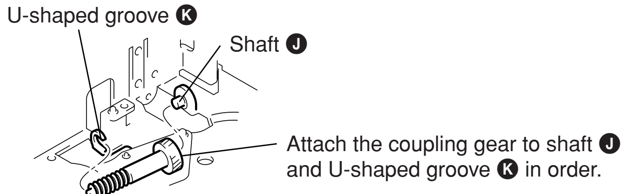


Fig. 9

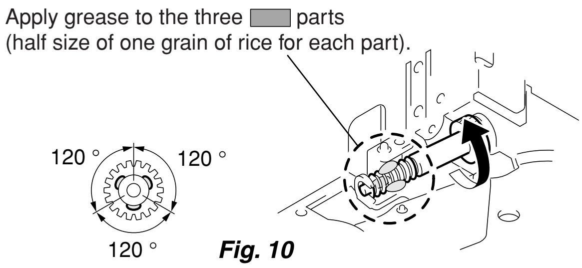


Fig. 10

⑥ Attach the main cam gear while being careful of the directions of the front and rear sides. Also, take care of the phase adjustment to the sub-cam gear. (Fig. 8, 11, 12)
Phase pin M of the main slider arm should be fitted in the groove of the main cam gear (rear side). (Fig. 5)

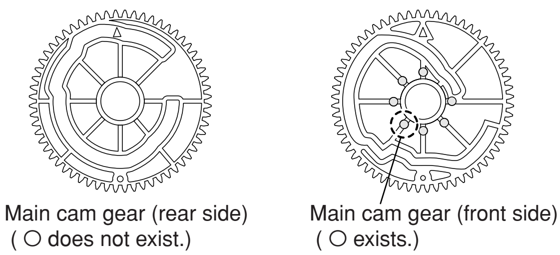


Fig. 12

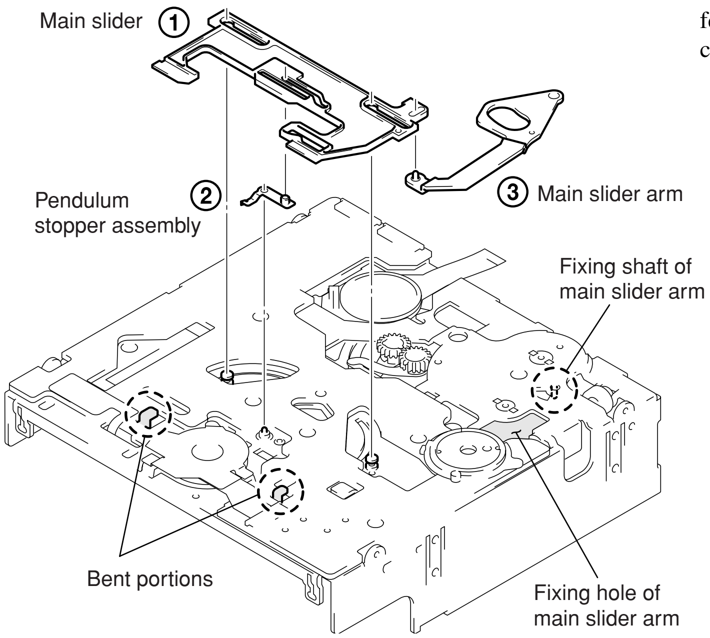
⑦ Attach the encoder gear. (Fig. 3)
Adjust the phases (marked) to those of the main cam gear. (Fig. 4/Fig. 8)

⑧ After moving the reel selector slider in the direction of arrow N to set the position of the reel base to "L cassette", attach the sub-slider in reverse order while referring to Fig. 3. (Fig. 13)

⑨ Attach the sub-slider arm. (Fig. 1/Fig. 13)

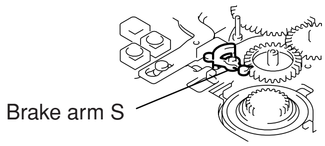
3-18. MAIN SLIDER, MAIN SLIDER ARM AND PENDULUM STOPPER ASSEMBLY

Disassembly: Remove them in order of ①➡②➡③



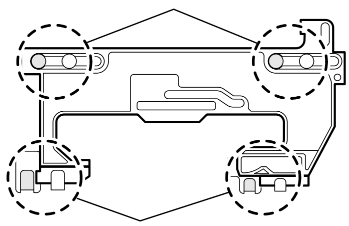
Disassembly of each part

The main slider controls several parts. Before removing the main slider, remove "Brake arm S" at the front of the chassis while referring to "Information" on page 6-5. Otherwise, the main slider cannot be removed.



Main slider

The main slider is fixed by the two shafts and the two bent portions at the rear of the chassis. The main slider can be removed when it is moved to the rightmost end (▬ positions).

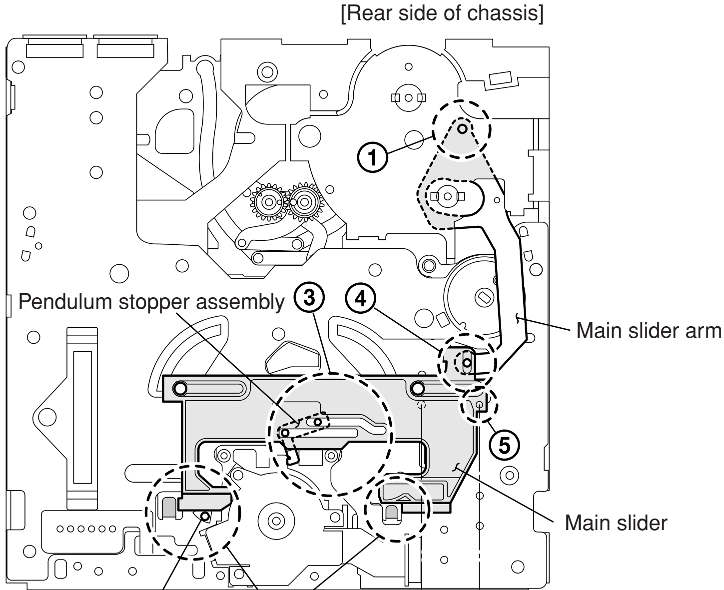


Assembly: Attach them while referring to the figure above or below and the descriptions.

Assembly of each part

Attach each part while referring to the figure above or below. When attaching the parts, adjust the positions carefully while referring to the instructions in the figure below. Because these positioning will be used as a reference when assembling in future, make sure to adjust the positions and phases correctly.

[Rear side of chassis]



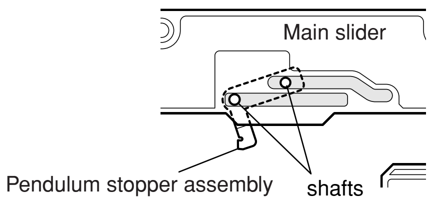
The shaft of the ratchet brake T should be at the position where it can be viewed fromthe outside as shown in the figure.

Move the main slider so that the positioning holes are superimposed.

① Insert the main slider arm into the fixing hole and attach it to the fixing shaft at the front of the chassis while referring to the figure above. (To facilitate assembly, stick adhesive tape so that the main slider arm does not drop.)

② Perform assembly so that the main slider can pass under the bent portion of the chassis. If "Ratchet brake T" remains, move down the "Ratchet brake T" as shown in the left figure and attach the main slider.

③ Carefully attach the pendulum stopper assembly so that the two shafts fit in the two long holes of the main slider.

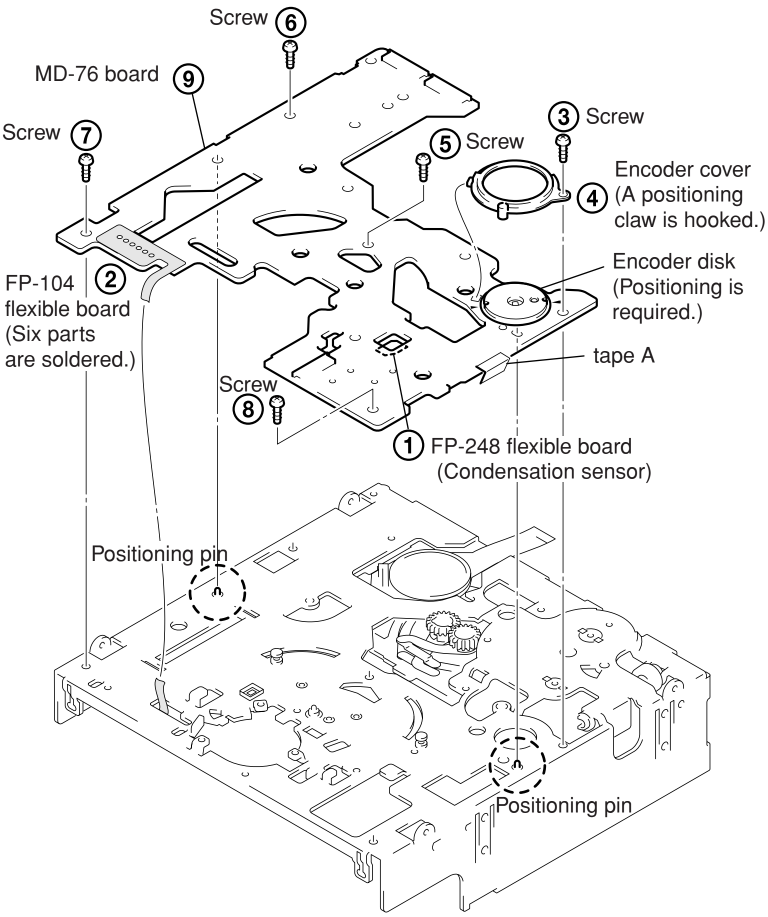


④ Attach the shaft of the main slider arm to the long hole of the main slider.

⑤ Move the main slider to the leftmost end so that the small positioning hole of the main slider is superimposed on the small positioning hole of the chassis, and fix the main slider. The position where the main slider is fixed will be used as a reference during assembling and phase adjustment in future.
(To avoid affecting the main unit, fix the reel motor and main slider with adhesive tape, etc.)

3-19. MD-76 BOARD AND ENCODER RETAINER

Disassembly: Remove them in order of ①➡②➡③➡④➡⑤➡⑥➡⑦➡⑧➡⑨



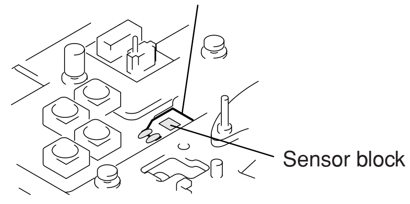
Disassembly of MD-76 board

Peel off the FP-248 flexible board at the front of the chassis (refer to page 6-14). Remove the six solders on the FP-104 flexible board from the rear of the chassis. Remove the screws in order of ③ to ⑧ shown in the figure. When removing the MD-76 board from the chassis, be careful not to let the sensors touch the chassis.

Note: When the tape A is removed, use the new tape A for replacement. (See the illustration below.)

FP-248 flexible board

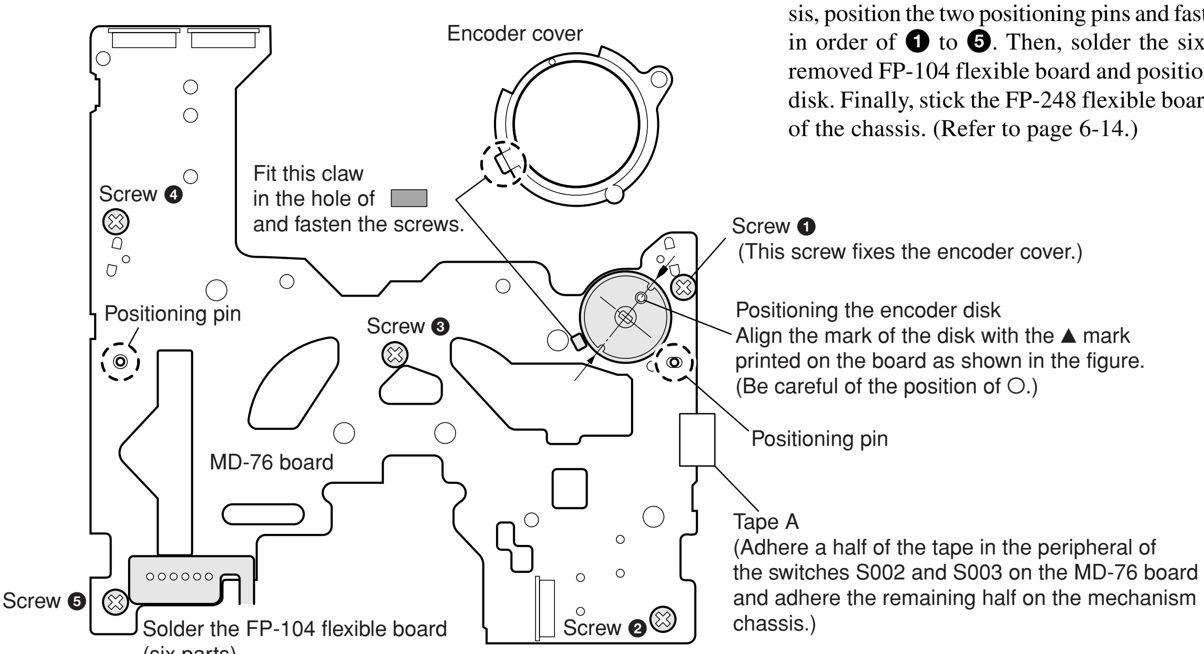
Peel off the flexible board while being careful not to get the sensor block dirty or damage the sensor block.



Assembly: Attach them in order of ⑨➡④➡③➡⑤➡⑥➡⑦➡⑧➡①➡②
(Refer to the figure above or below.)

Assembly of MD-76 board

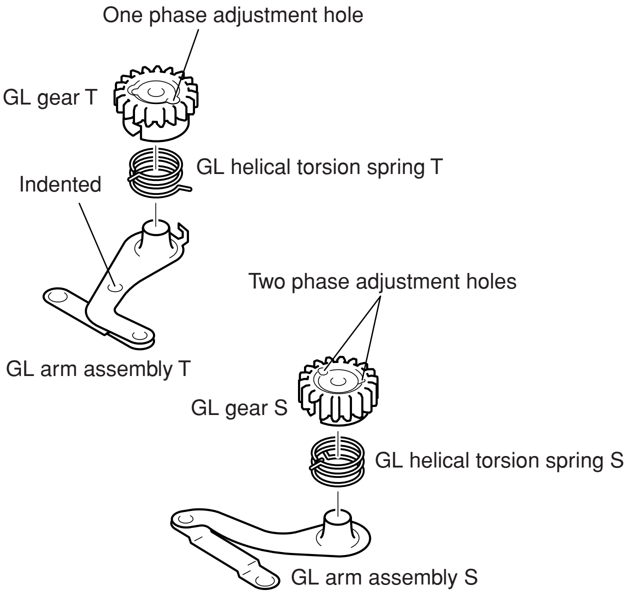
While being careful not to let the sensors touch the chassis, position the two positioning pins and fasten the screws in order of ❶ to ❺. Then, solder the six parts on the removed FP-104 flexible board and position the encoder disk. Finally, stick the FP-248 flexible board on the front of the chassis. (Refer to page 6-14.)



Tightening torque of MD-76 board
0.3432 ± 0.0196 N·m (3.5 ± 0.2 kg • cm)

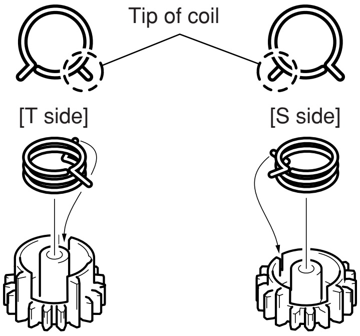
3-20. COMPONENTS OF GL ARM S/T ASSEMBLY (GL ARM ASSEMBLY, GL HELICAL TORSION SPRING, GL GEAR)

Disassembly and distinguishing the S side from the T side



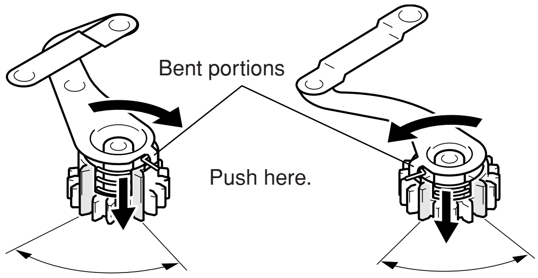
Assembly

① Attach each GL helical torsion spring to the GL gear. To distinguish the S side from the T side when the opening of the spring tip is facing toward the front, note that the coil tip of the S side is located on the left and that of the T side is located on the right.



Fit the tip of the spring into the small cut-out of the GL gear.

② Hook the tip of the spring on the bent portion of the GL arm assembly and push the bent portion of the GL arm into the large cut-out of the GL gear while rotating the GL gear in the direction of the arrow.

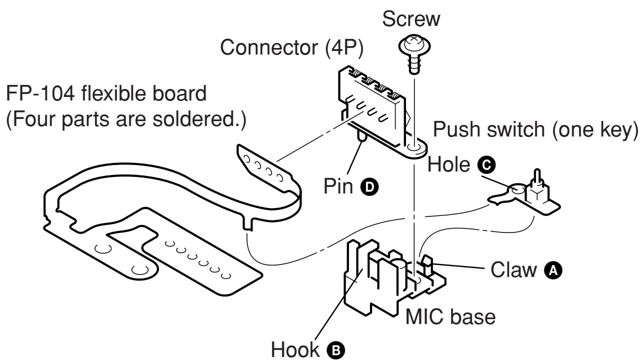


When the bent portion of the GL arm comes inside this range, push the bent portion into the gear.

3-21. COMPONENTS OF MIC BASE ASSEMBLY (FP-104 FLEXIBLE BOARD, MIC BASE)

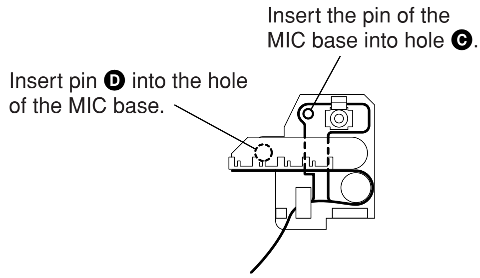
Disassembly

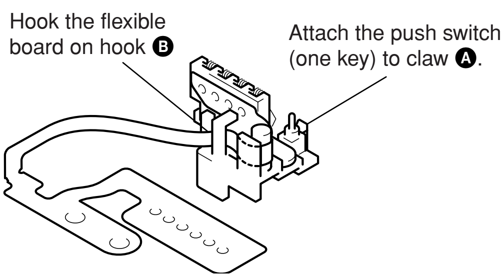
Remove the push switch from claw Ⓐ of the MIC base. Remove the screw and connector (4P). Then, remove the flexible board while being careful not to touch hook Ⓑ.



Tightening torque of connector (4P)
0.0392 ± 0.0098N • m (0.4 ± 0.1 kg • cm)

Assembly

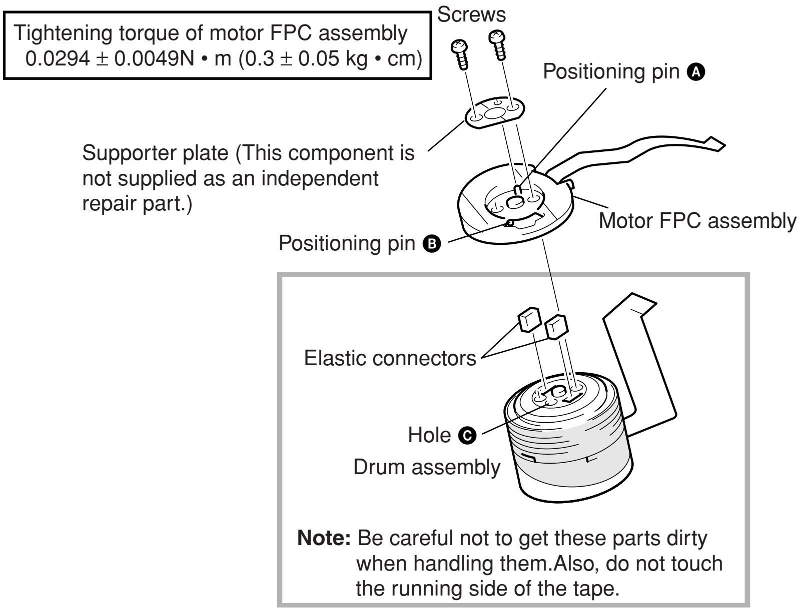




3-22. COMPONENTS OF DRUM ASSEMBLY (MOTOR FPC ASSEMBLY, ELASTIC CONNECTOR)

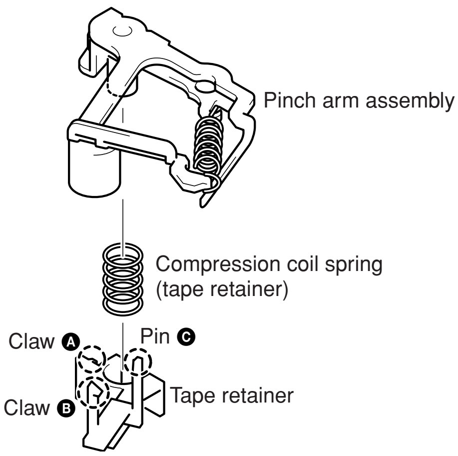
Disassembly/Assembly

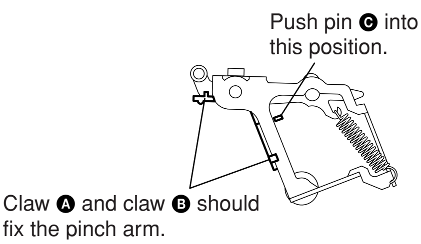
Connect the elastic connector to the drum assembly and attach the motor FPC assembly while aligning pin Ⓑ with hole Ⓒ of the drum assembly. Fix the supporter plate with the screws while being careful of pin Ⓐ of the motor FPC assembly.



3-23. COMPONENTS OF PINCH ARM ASSEMBLY (TAPE RETAINER, COMPRESSION COIL SPRING)

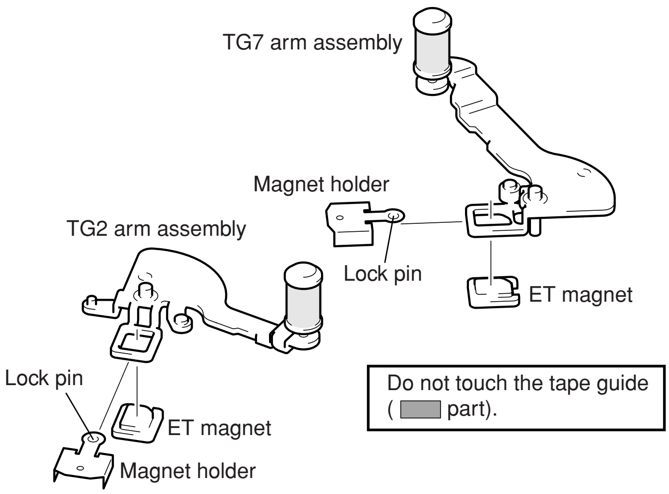
Disassembly/Assembly



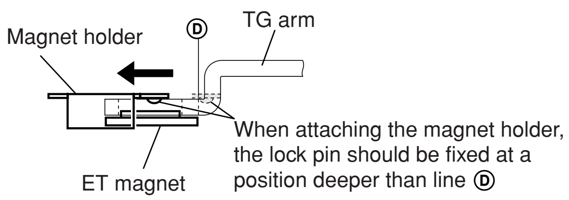


3-24. COMPONENTS OF TG2/7 ARM ASSEMBLY (ET MAGNET, MAGNET HOLDER)

Disassembly/Assembly



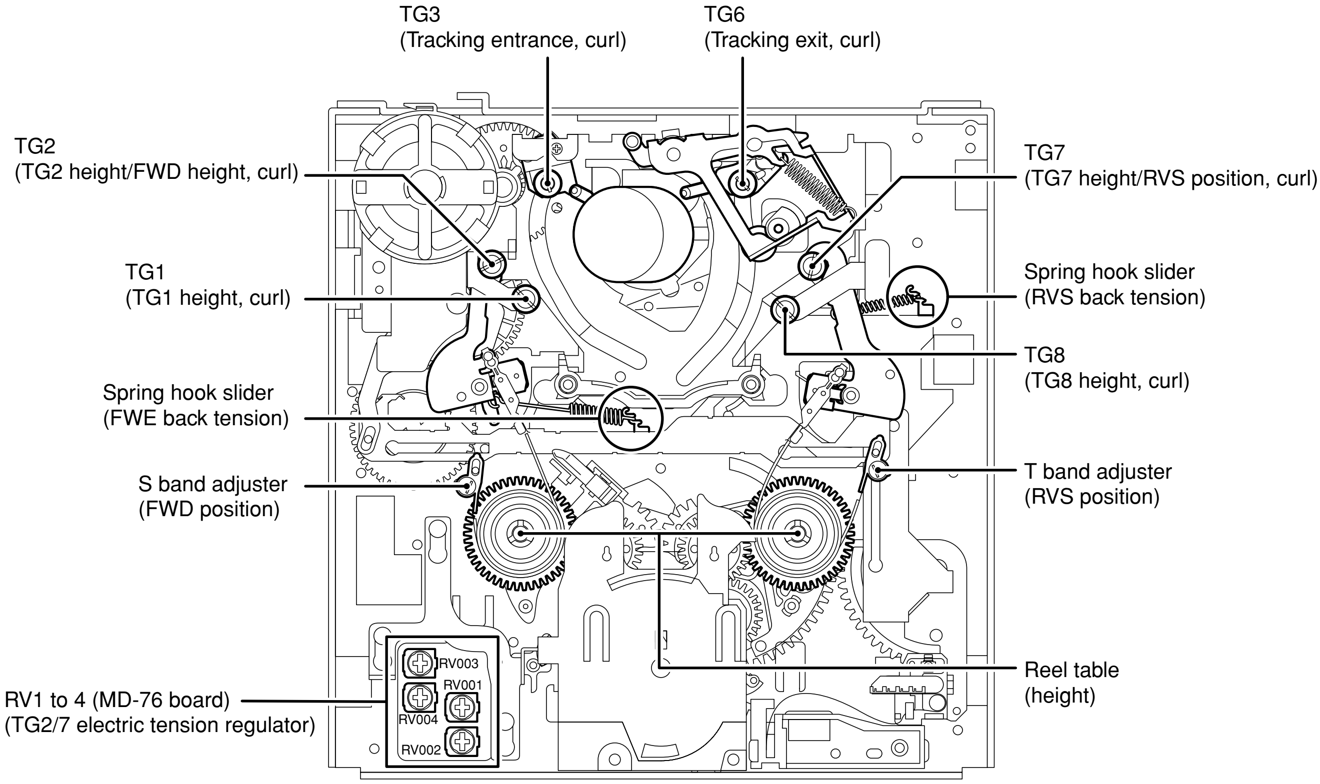
Remove the TG2 arm assembly and the TG7 arm assembly in the direction of the arrow while pushing the lock pin of the magnet holder from the rear of each TG arm. To attach them, insert the TG2 or TG7 arm assembly in the direction opposite to the arrow while holding the ET magnet with the magnet holder, then hook the lock pin.



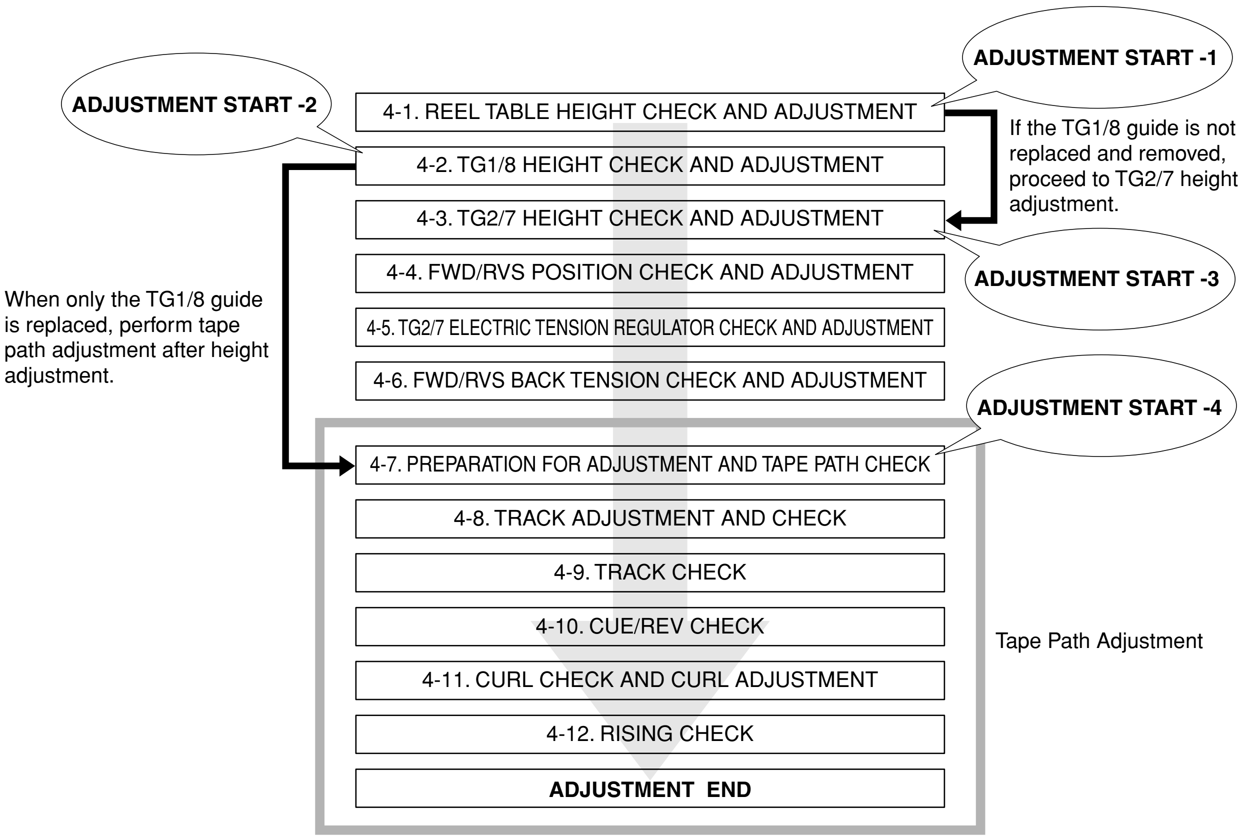
6-1-4. CHECK AND ADJUSTMENT

- When the parts of the tape path (tape guide, reel table, etc.) have been removed or parts have been replaced, adjust the following parts according to the flowchart below.

• ADJUSTMENT POSITION



• ADJUSTMENT ORDER (FLOWCHART)

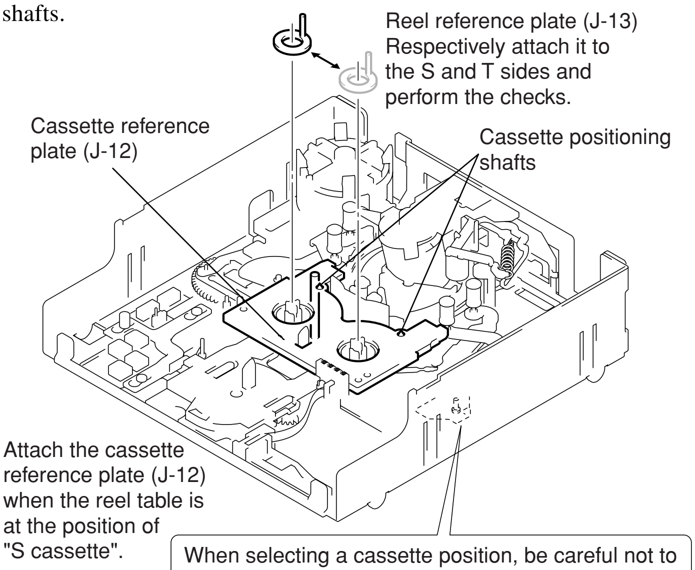


4-1. REEL TABLE HEIGHT CHECK AND ADJUSTMENT

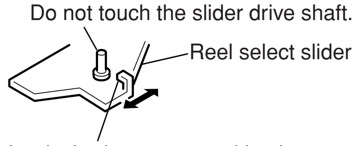
1. Preparation before check

Check that the cassette compartment has already been removed. (Refer to page 6-6.)

Fit the cassette reference plate (J-12) in the cassette positioning shafts.



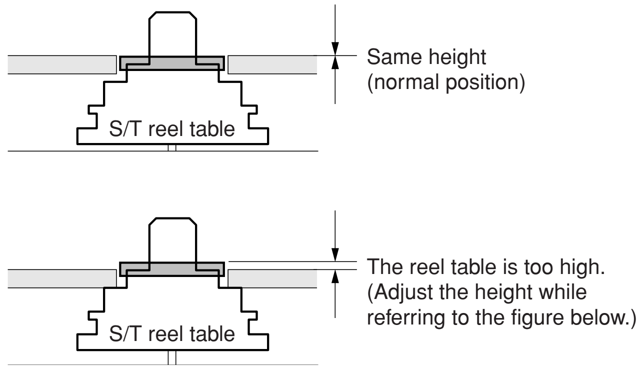
When selecting a cassette position, be careful not to touch the slider drive shaft because it can be easily bent or broken.

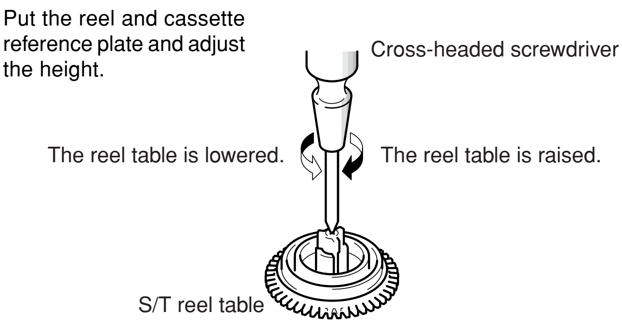


Select the desired cassette position by pressing the claw position.

2. Check and adjustment

Put the reel reference plate (J-13) on each reel table. Rotate the screw block of the reel table so that the height of the cassette reference plate is the same as that of the reel reference plate.

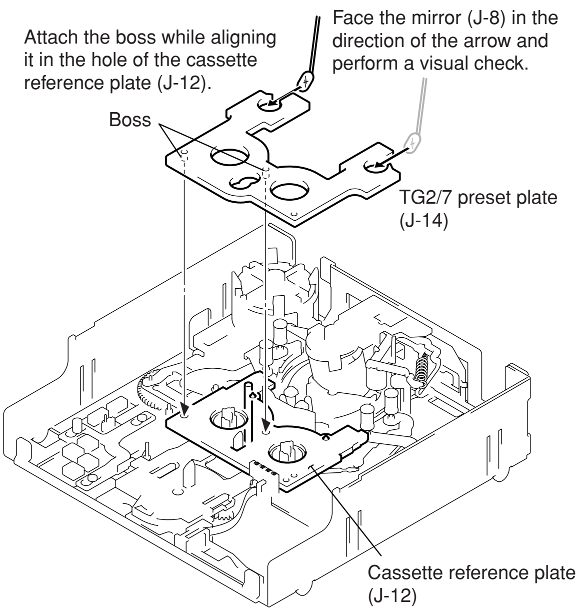




4-2. TG1/8 HEIGHT CHECK AND ADJUSTMENT

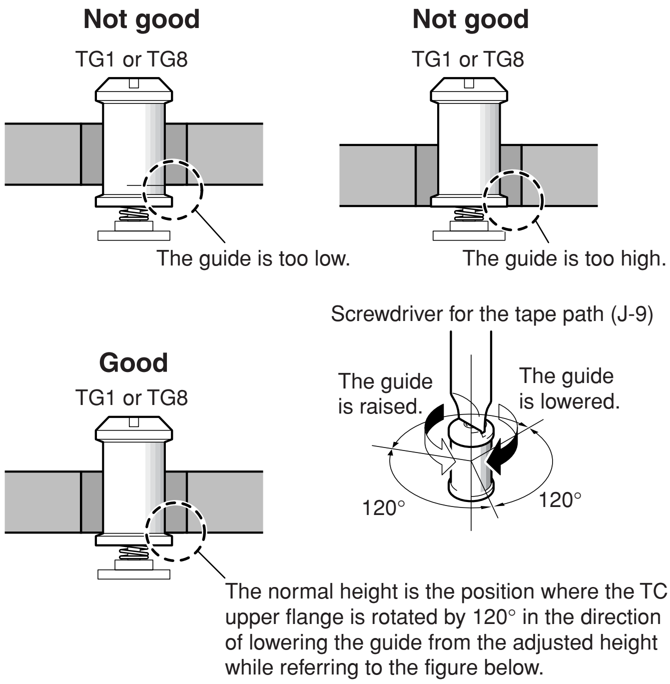
1. Preparation before check

1) Check that the cassette compartment block has already been removed. (Refer to page 6-6.)
2) Set the mechanism deck to the loading end position (TG2 to 7 already moved to the loading end position and the pinch roller is in the unloading position). Alternatively, set the mechanism deck to the “LE position” using the mode selector II. (Refer to page 6-7.)
3) Place the TG2/7 preset plate (J-14).



2. Check and adjustment

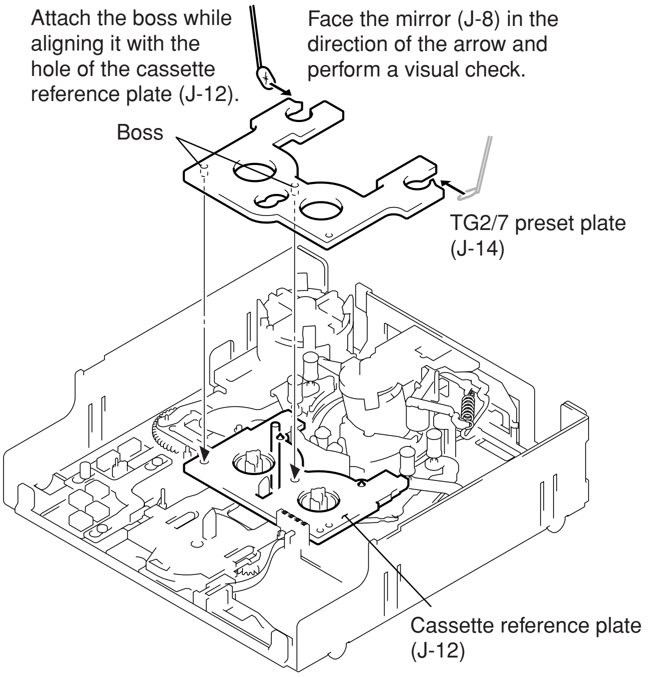
Rotate the TG upper flange until the heights of the TG2/7 preset plate (J-14) and TG1 or TG8 roller block are the same. Alternatively, rotate the TG upper flange by 120˚ in the direction of lowering the guide from the reference height where the preset plate and roller have the same height.



4-3. TG2/7 HEIGHT CHECK AND ADJUSTMENT

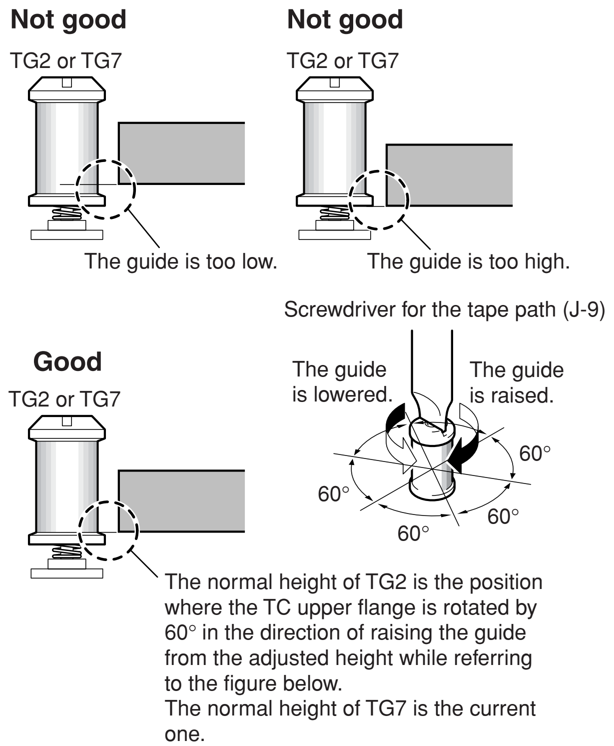
1. Preparation before check

1) Check that the cassette compartment block has already been removed. (Refer to page 6-6.)
2) Set the mechanism deck to the loading end position (TG2 to 7 already moved to the loading end position and the pinch roller is in the unloading position). Alternatively, set the mechanism deck to the “LE position” using the mode selector II. (Refer to page 6-7.)
3) Place the TG2/7 preset plate (J-14).



2. Check and adjustment

Rotate the TG upper flange until the height of the TG2/7 preset plate (J-14) and TG2 or TG7 roller block is the same. Alternatively, rotate the TG upper flange of only TG2 by 60˚ in the direction of raising the guide from the adjusted height while referring to the figure below.



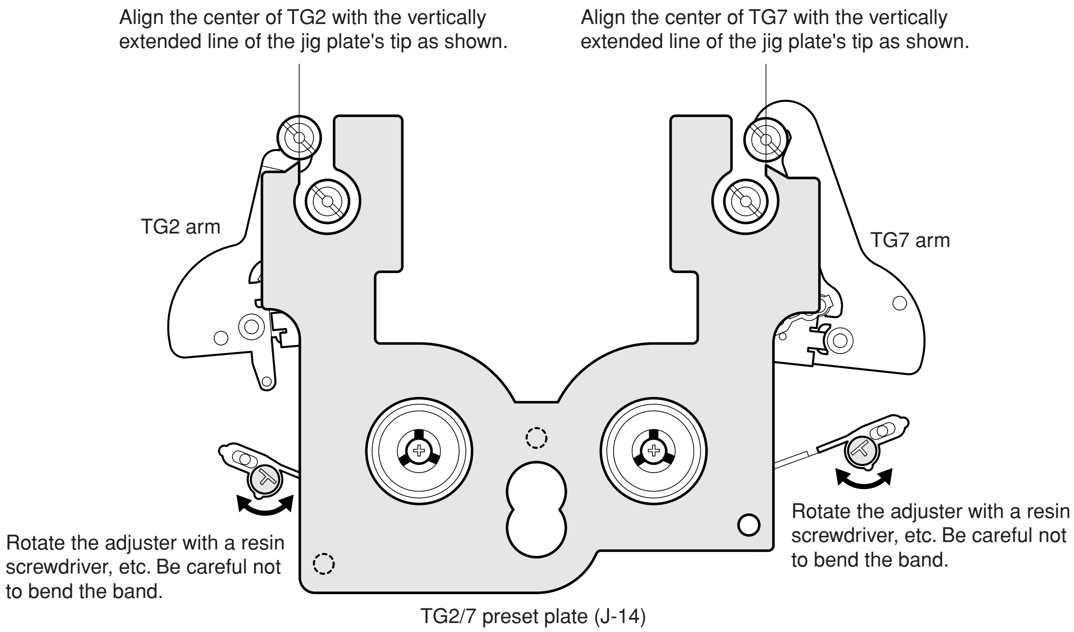
4-4. FWD/RVS POSITION CHECK AND ADJUSTMENT

1. Preparation before check

1) Check that the cassette compartment block has already been removed. (Refer to page 6-6.)
2) Set the mechanism deck to the loading end position (TG2 to 7 already moved to the loading end position and the pinch roller is in the unloading position). Alternatively, set the mechanism deck to the “LE position” using the mode selector II. (Refer to page 6-7.)
3) Place the TG2/7 preset plate (J-14).

2. Check and adjustment

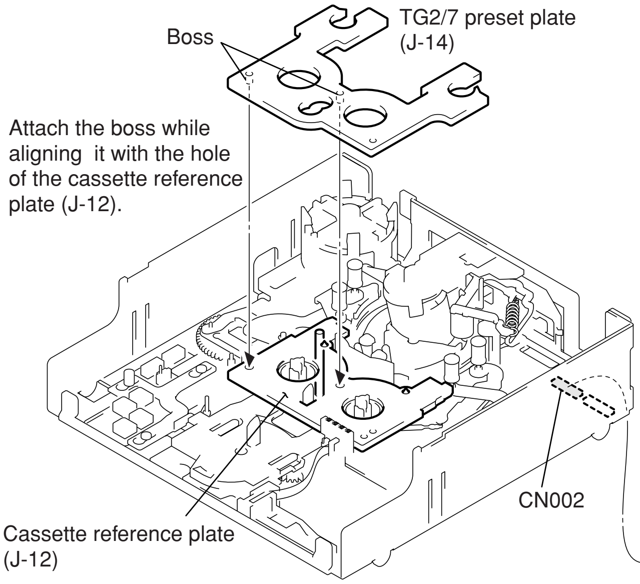
Rotate each adjuster to adjust the TG2/7 position until ⊿ or ⊾ of the TG2/7 preset plate (J-14), TG2 and TG7 are in line.

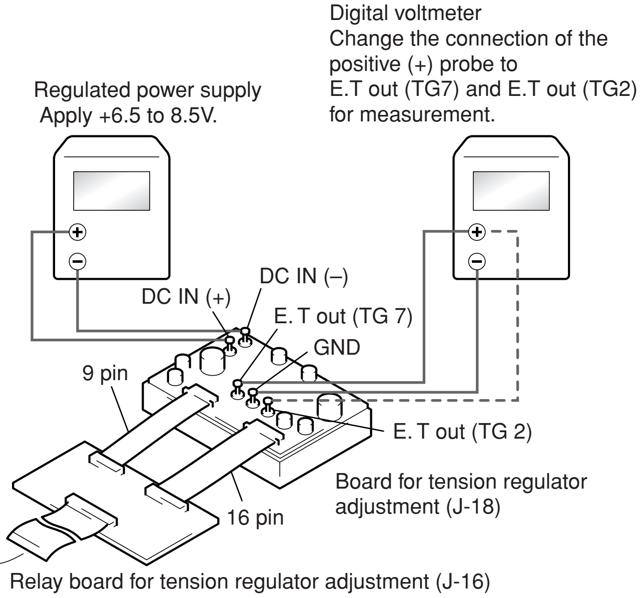


4-5. ELECTRIC TENSION REGULATOR CHECK AND ADJUSTMENT OF TG2/7 ARM

1. Preparation before check

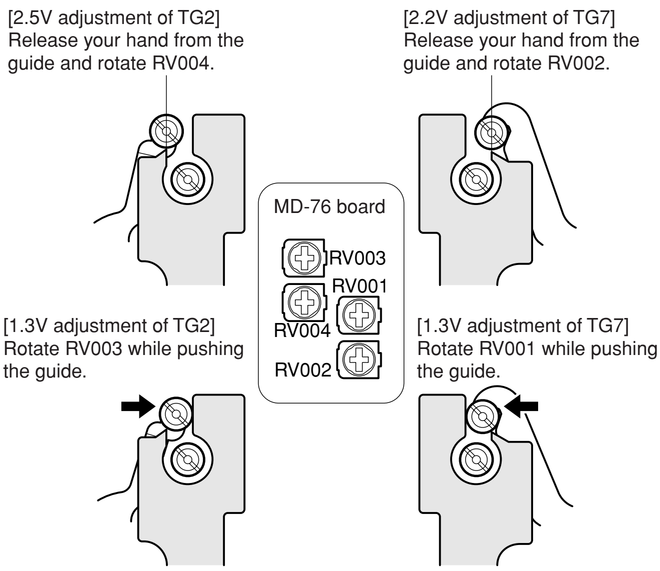
1) Check that the cassette compartment block has already been removed. (Refer to page 6-6.)
2) Set the mechanism deck to the loading end position (TG2 to 7 already moved to the loading end position and the pinch roller is in the unloading position). Alternatively, set the mechanism deck to the “LE position” using the mode selector II (J-15). (Refer to page 6-7.)
3) Attach the cassette reference plate (J-12) and TG2/7 preset plate (J-14). (Refer to page 6-25.)
4) Connect the relay board for tension regulator adjustment (J-16) and other equipment as shown in the figure below.



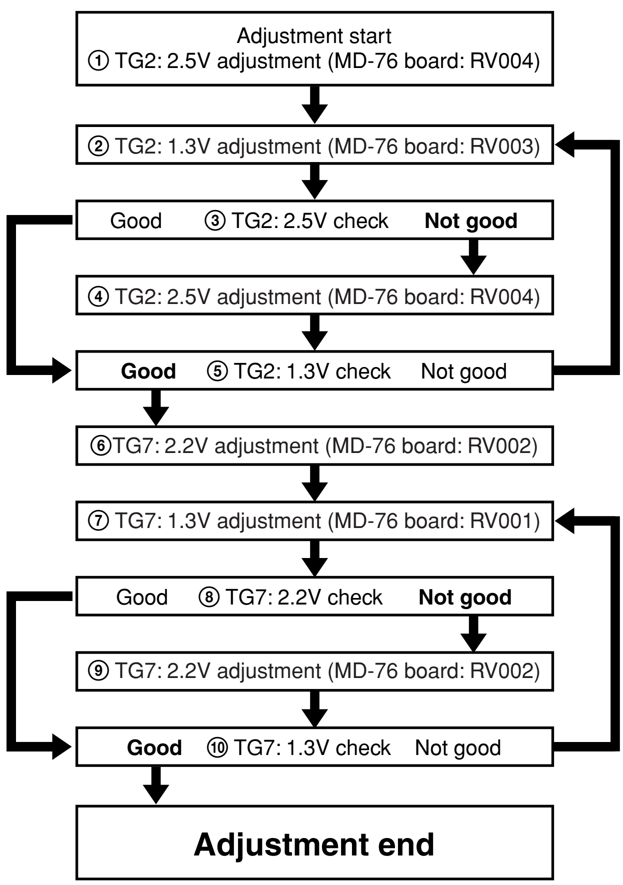


2. Check and adjustment

Connect the positive (+) probe of a digital voltmeter to E.T out (TG2: for measurement of TG2 data) or to E.T out (TG7: for measurement of TG7 data). First, press the guide to the TG2/7 preset plate (J-14), then release your hand from the guide and read the voltmeter value. Adjust RV004 (TG2 side) or RV002 (TG7 side) until the voltmeter measurement is 2.5 ± 0.1 V (TG2 side) or 2.2 ± 0.1 V (TG7 side) when releasing your hand. Then press the guide to the TG2/7 preset plate (J-14). Adjust RV003 (TG2 side) or RV001 (TG7 side) until the voltmeter measurement is 1.3 ± 0.1 V.



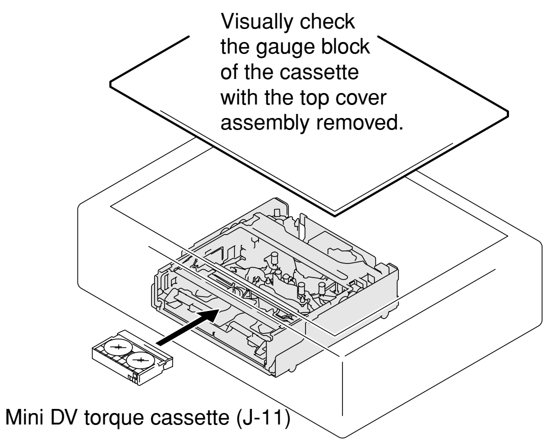
[Adjustment order]

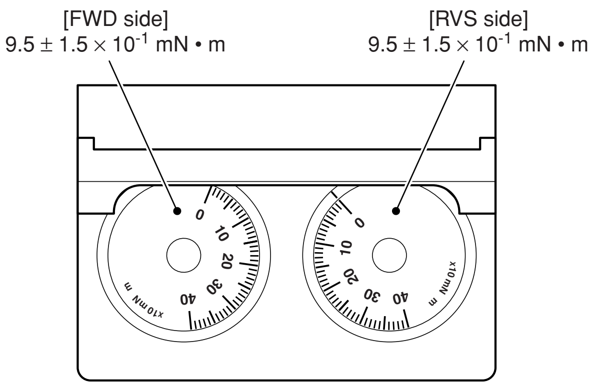


4-6. FWD/RVS BACK TENSION CHECK AND ADJUSTMENT

1. Preparation before check

Mount the mechanism deck in the main unit, connect all the connectors, then insert the mini DV torque cassette (J-11) into the mechanism block.

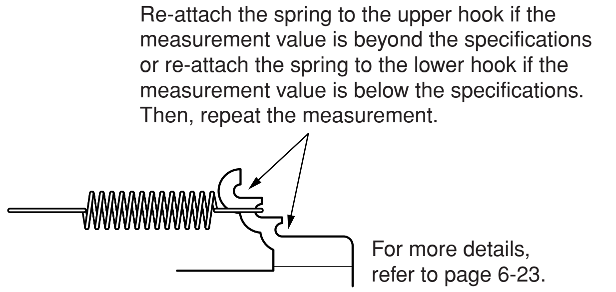




2. Check and adjustment

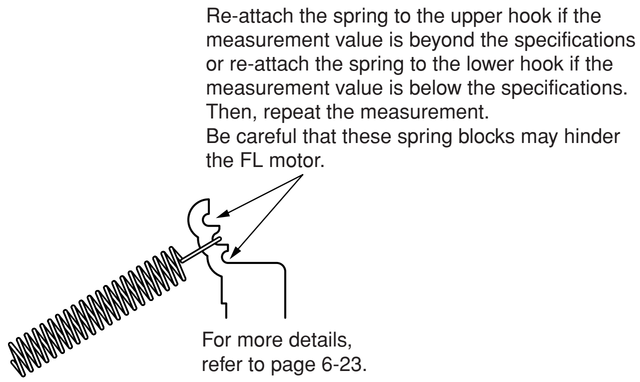
- FWD (TG2) side

  The torque value should satisfy $9.5 \pm 1.5 \times 10^{-1}$ mN • m while the mini DV torque cassette runs in the FWD mode. If it does not satisfy this, take the following measure.



- RVS (TG7) side

  The torque value should satisfy $9.5 \pm 1.5 \times 10^{-1}$ mN • m while the mini DV torque cassette runs in the RVS mode. If it does not satisfy this, take the following measure.



4-7. PREPARATION FOR ADJUSTMENT AND TAPE PATH CHECK

Preparation before adjustment (connection and setting)

1. Mount the mechanism deck in the main unit.
   (Connect all the connectors.)

2. Clean the tape running side.
   (Refer to “6-1-2. Periodic check”.)

3. Connect an oscilloscope to VD-036 board CN4002 via the CPC-8 jig (J-6082-388-A)(J-23).
   Channel 1: VD-036 board, CN4002 Pin ⑬ (Note)
   External trigger: VD-036 board, CN4002 Pin ⑮

Note: Connect a 75 Ω resistor between pins ⑬ of CN4002 and ② (GND).
75 Ω resistor (Parts code: 1-247-804-11)

4. Connect the adjustment remote commander (J-1, J-2) to the LANC jack.

5. Turn the HOLD switch of the adjustment remote commander to the ON position. (Set the slide switch to SERVICE)

6. Select page: 3, address: 33, set data: 08 and press the PAUSE (Write) button.

7. Select page: 3, address: 26, set data: 31 and press the PAUSE (Write) button.

Procedure after operations

1. Connect the adjustment remote commander to the LANC jack.

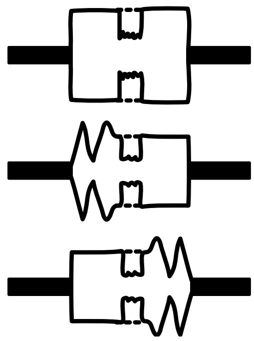
2. Turn the HOLD switch of the adjustment remote commander to the ON position. (Set the slide switch to SERVICE)

3. Select page: 3, address: 33, set data: 00 and press the PAUSE (Write) button.

4. Select page: 3, address: 26, set data: 00 and press the PAUSE (Write) button.

Tape path check (checking the RF waveform)

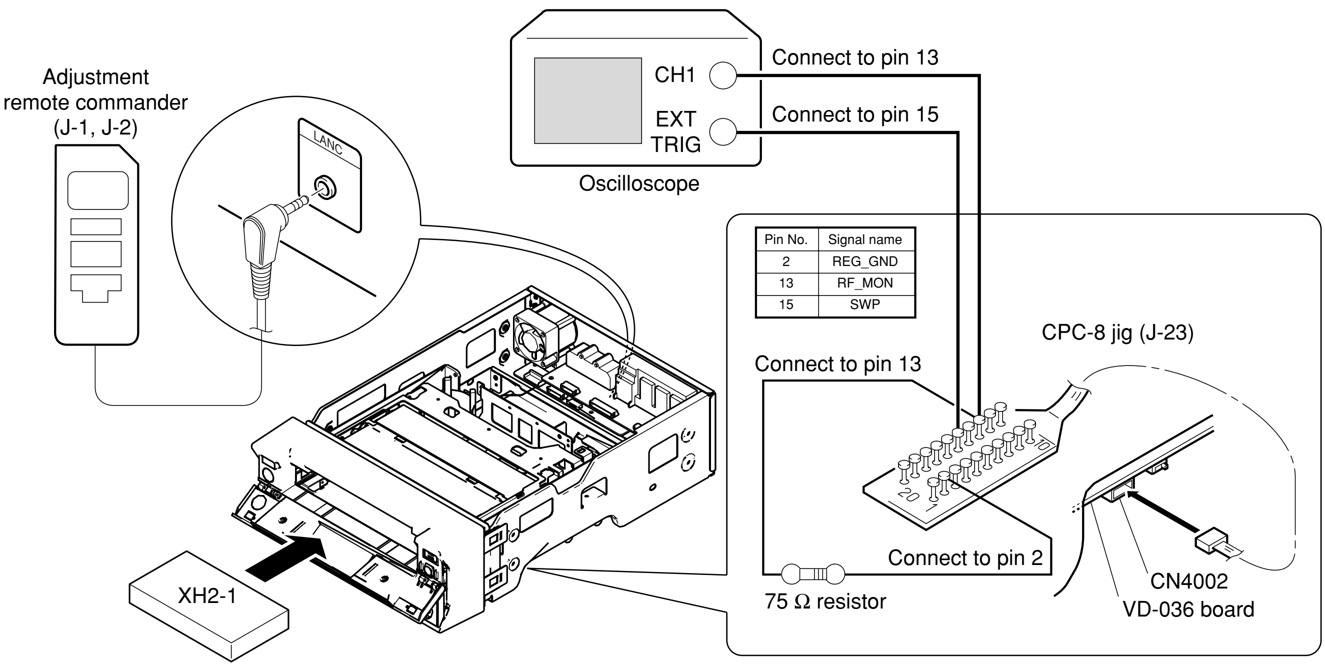
Play back the tracking tape (J-10) and check the states at the entrance and exit of the RF waveform. If it is not flat at either side, perform the adjustments from Adjustment Start-4 in the flowchart on page 6-23.



Normal entrance and exit sides

Faulty entrance side

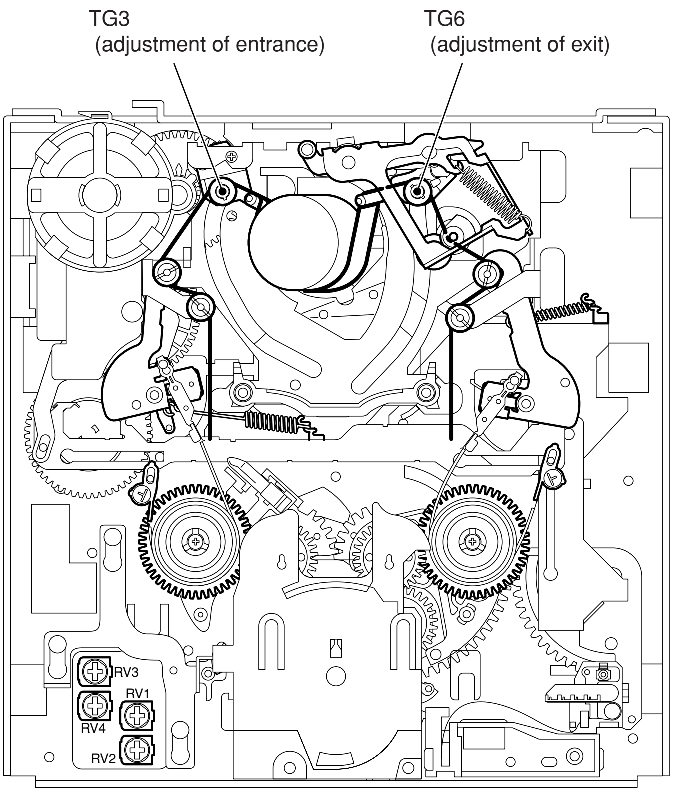
Faulty exit side



4-8. TRACK ADJUSTMENT AND CHECK (Checking the RF Waveform)

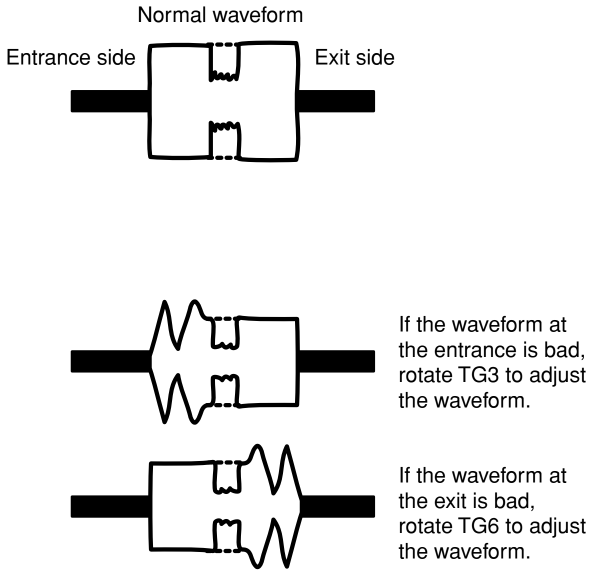
• Checking the RF waveform

Check that the RF waveforms at both the entrance and exit are flat while the tracking tape (J-10) runs in the PLAY mode.



• If not flat

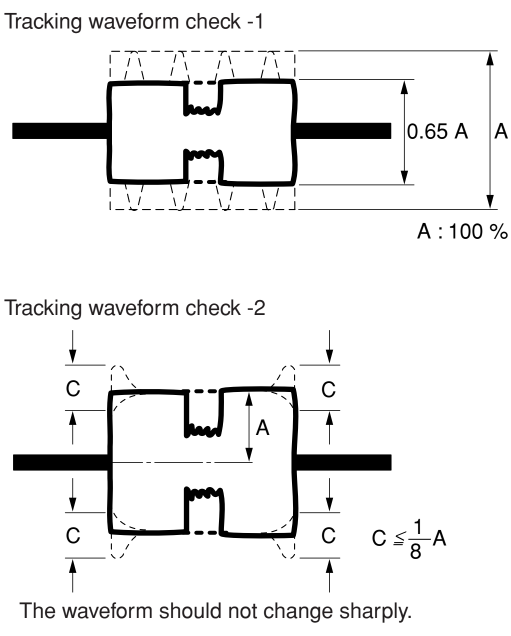
If the waveform at the entrance is bad, rotate TG3. If the waveform at the exit is bad, rotate TG6 to flatten the waveform.

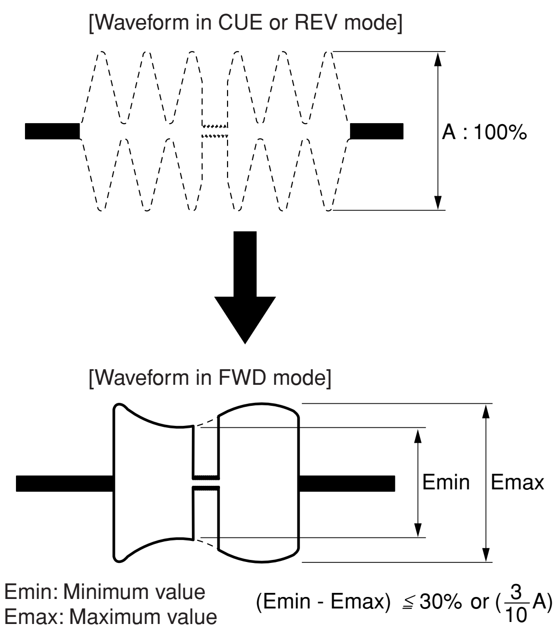


4-9. TRACK CHECK

• Check

The difference between the maximum value and minimum value of the waveform amplitude during playback of the tracking tape (J-10) in the FWD mode should be 30% or less of the waveform amplitude during the CUE (or REV) mode (which is taken as 100% as shown). At the same time, there must not exist too much fluctuation of waveform amplitude.

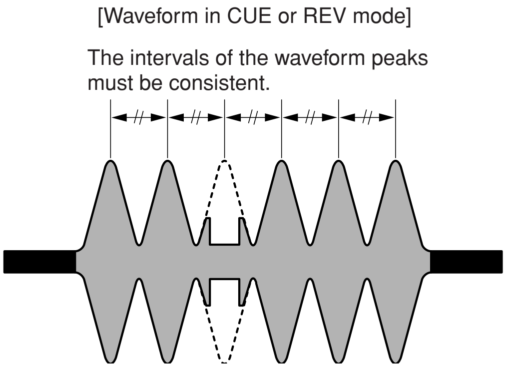




4-10. CUE/REV CHECK

• Check

Check that the intervals of the waveform peaks are consistent while the tracking tape (J-10) runs in the CUE mode or REV mode.



• If not even

If the waveform peaks are not even, perform Section 4-8, "Tack-ing adjustment".

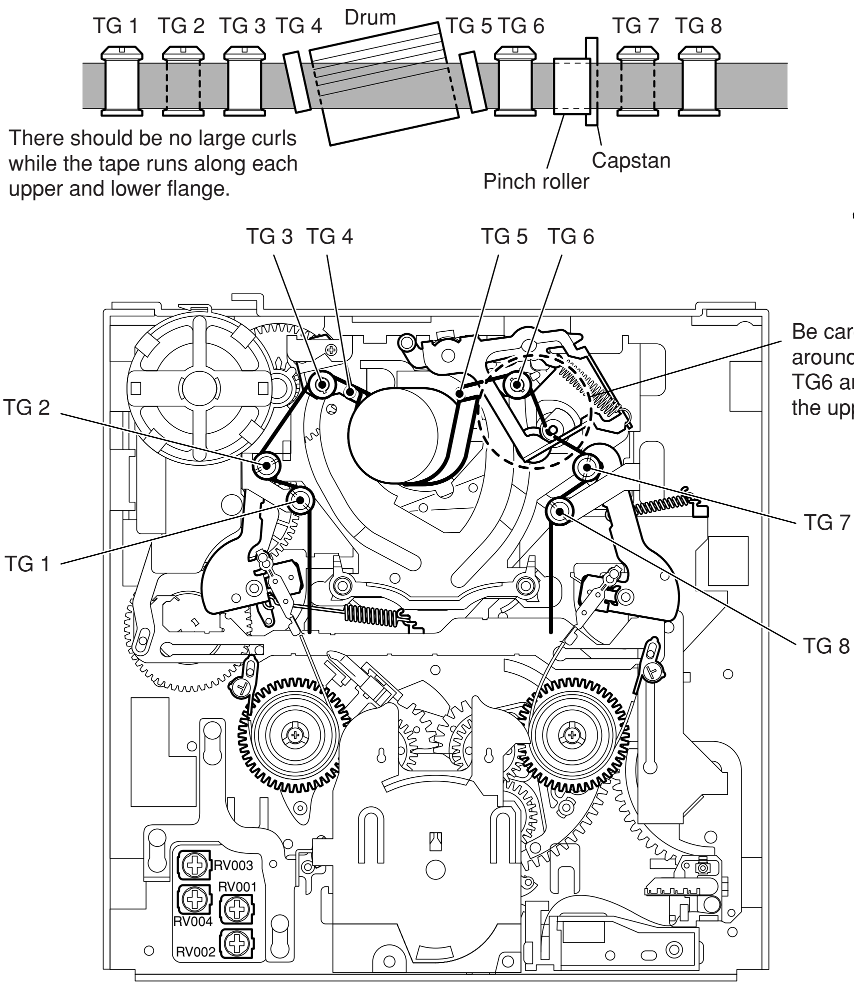
4-11. CURL CHECK AND ADJUSTMENT

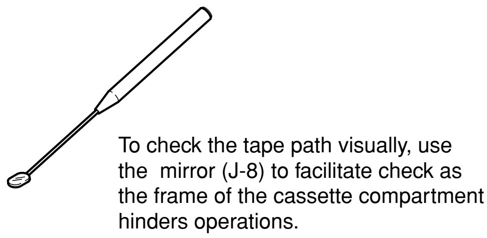
• Check

Check that the tape runs along each upper and lower flange while the tracking tape (J-10) runs in the CUE or REV mode. Also check that there are no large curls on each tape guide and pinch roller.

• If the curl is large

Perform the adjustment from Adjustment Start -3 (TG7 side) of the flowchart on page 6-23 again.





4-12. RISING CHECK

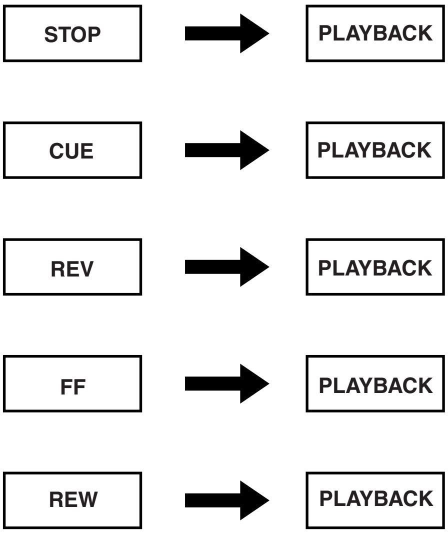
• Check

Check that when the tracking tape (J-10) is switched from the STOP, CUE, REV, FF, REW modes to the PLAYBACK mode, the waveform rises horizontally within 2 seconds. (Perform this 2 or 3 times.)

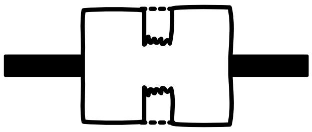
• Check after checking rising

• Check that the tape loads and unloads smoothly.

• Play a self-recorded or already recorded tape, and check that the sound and images are normal.



When switching the modes, the waveform should rise horizontally within 2 seconds.



6-2. VIDEO SECTION ADJUSTMENTS

2-1. PREPARATIONS BEFORE ADJUSTMENTS

Use the following measuring instruments for video section adjustments.

2-1-1. Precautions on Adjusting

Note: Before performing the adjustment, check the data of page: 0, address: 10 is “00”. If not, select page: 0, address: 00, and set data “00”.

2-1-2. Adjusting Connectors

The measuring point of the playback RF signal is CN4002 of VD-036 board. Connect the measuring instruments via the CPC-8 jig (J-6082-388-A). Refer to “MECHANISM SECTION ADJUSTMENT” for the measuring method. The following table lists the pin numbers and signal names of CN4002.

Pin No.	Signal Name	Pin No.	Signal Name
1	EVF_COM_DC (N.C.)	2	REG_GND
3	REG_GND	4	MT_5.5V
5	EXT_DA (N.C.)	6	REG_GND
7	EVF_VCO (N.C.)	8	MS_LED_ON
9	EVF_VG (N.C.)	10	MS_BS
11	PSIG (N.C.)	12	MS_SCLK
13	RF_MON	14	MS_VCC_ON
15	SWP	16	XMS_IN
17	FRRV	18	MS_DIO
19	REC_CRRT1 (N.C.)	20	REC_CRRT0 (N.C.)

Table. 6-2-1

2-1-3. Connecting the Equipment

Connect the measuring instruments as shown in Fig. 6-2-1, and perform the adjustments.

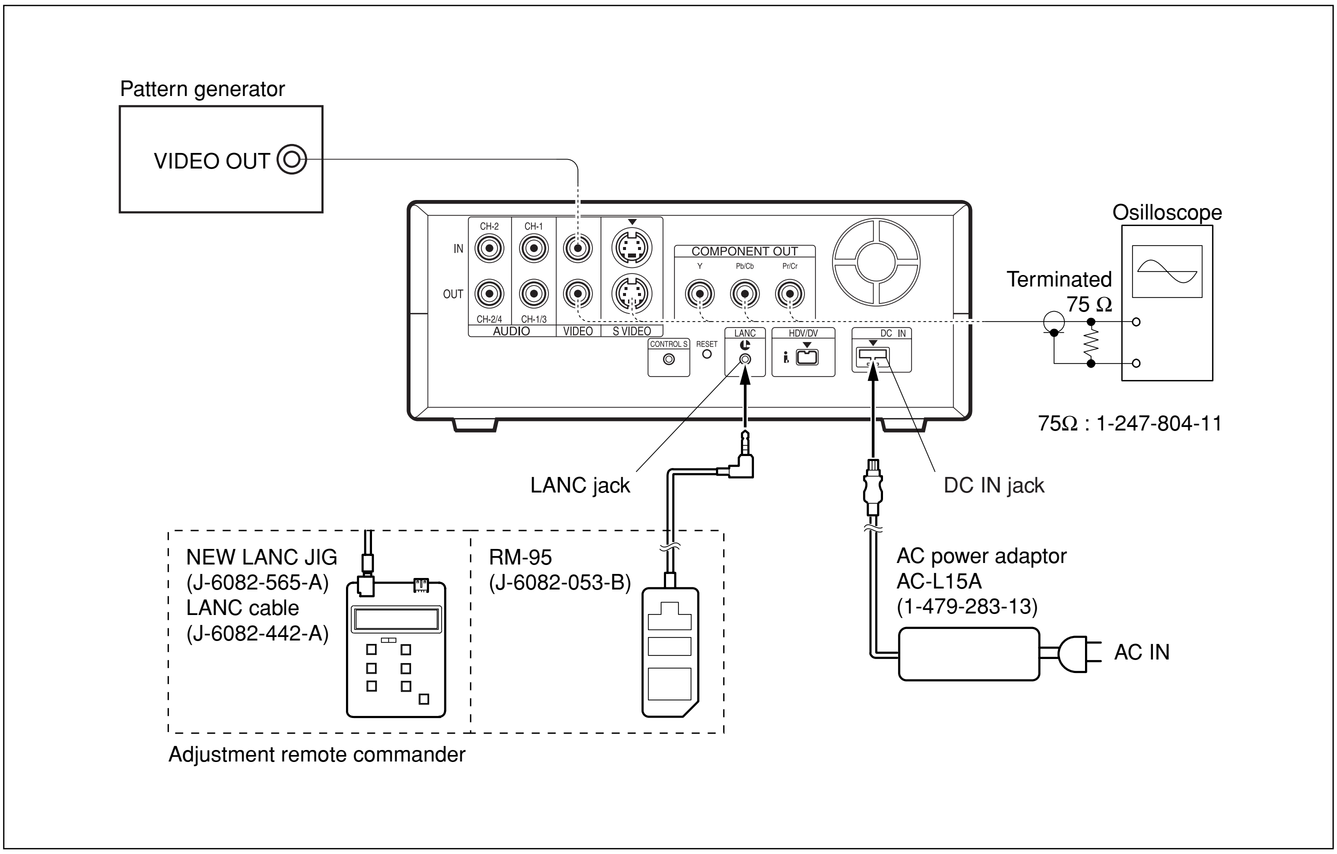


Fig. 6-2-1

2-1-4. Alignment Tapes

Use the alignment tapes shown in the following table.
Use tapes specified in the signal column of each adjustment.

Name	Use
Tracking standard (XH2-1)	Tape path adjustment
SW/OL standard (XH2-3)	Switching position adjustment
Audio operation check (XH5-3(NTSC), XH5-3P(PAL))	Audio system adjustment
System operation check (XH5-5(NTSC), XH5-5P(PAL))	Operation check

Fig. 6-2-2 shows the 75% color bar signals recorded on the alignment tape for Audio Operation Check.

Note: Measure with video terminal (Terminated at 75 Ω)

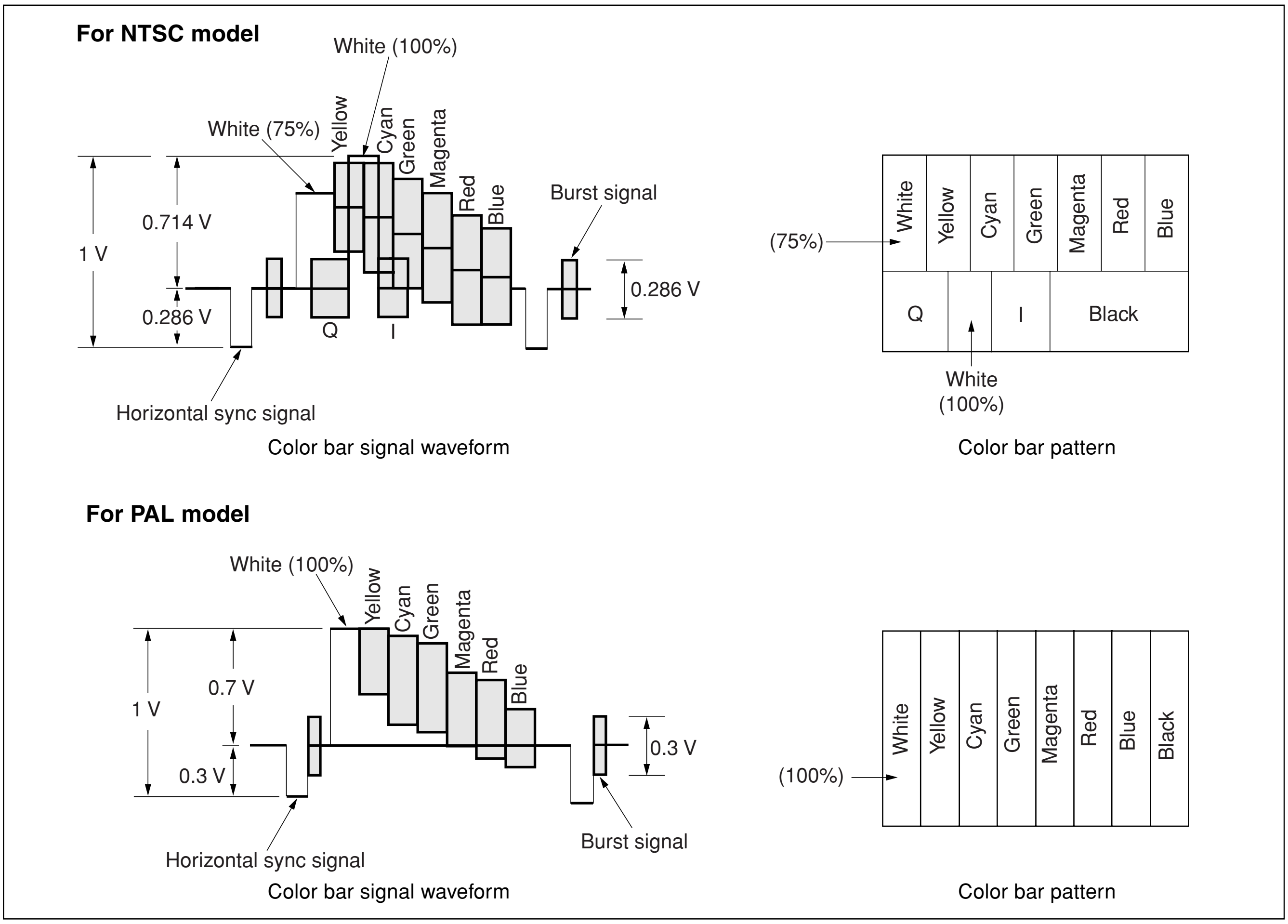


Fig. 6-2-2 Color bar signal of alignment tapes

2-1-5. Input/output Level and Impedance

AUDIO jacks

IN — Pin jack: –10 dBu
Impedance: Minimum 10 kΩ (kilo ohms), unbalanced
Maximum input level:
+16 dBu (approx. 5 Vrms) 60i system
+14 dBu (approx. 4 Vrms) 50i system

OUT Pin jack
Impedance: Maximum 1 kΩ (kilo ohms)
Output level: 47 kΩ (kilo ohms) loading, unbalanced
–10 dBu (= full bit –20 dB) 60i system
–10 dBu (= full bit –18 dB) 50i system

VIDEO jacks

IN/OUT — Pin jack, unbalanced
1.0 Vp-p
(75 Ω (ohms), sync negative)
Sync signal:
0.286 Vp-p (60i/NTSC)
0.3 Vp-p (50i/PAL)
Burst signal:
0.286 Vp-p (60i/NTSC)
0.3 Vp-p (50i/PAL)

S VIDEO jacks

IN/OUT — Mini DIN 4-pin, unbalanced
Luminance signal:
1.0 Vp-p
(75 Ω (ohms), sync negative)
Sync signal:
0.286 Vp-p (60i/NTSC)
0.3 Vp-p (50i/PAL)
Chrominance signal:
0.286 Vp-p (60i/NTSC)
(burst, 75 Ω (ohms))
0.3 Vp-p (50i/PAL)
(burst, 75 Ω (ohms))

COMPONENT OUT jacks

OUT — Pin jack

Output at 480i NTSC

With [BETACAM] selected in [IN/OUT REC] menu
Y: 1.0 Vp-p
(with 0.286 Vp-p sync negative, output impedance 75 Ω (ohms), unbalanced)
Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p
(output impedance 75 Ω (ohms), unbalanced)
(75% color bars with 7.5 IRE setup)

With [SMPTE] selected in [IN/OUT REC] menu
Y: 1.0 Vp-p
(with 0.3 Vp-p sync negative, output impedance 75 Ω (ohms), unbalanced)
Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p
(output impedance 75 Ω (ohms), unbalanced)
(100% color bars with no setup)

Output with other settings
Y: 1.0 Vp-p
(output impedance 75 Ω (ohms), unbalanced)
Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p
(output impedance 75 Ω (ohms), unbalanced)
(100% color bars with no setup)
480i/480p:
Y: with 0.3 Vp-p sync negative
1080i:
Y/Pb/Pr: with 0.6 Vp-p 3-level sync

i. HDV/DV jack

i.LINK (IEEE1394, 4-pin connector S100)

Remote control

LANC — Stereo mini-minijack (ø 2.5)
CONTROL S IN — Stereo minijack (ø 3.5)

2-2. INITIALIZATION OF 8, 9, A, B, C, D, 13, 18, 1A, 1B, 1C, 1D PAGE DATA

Note : When reading or writing the 13, 18, 1A, 1B, 1C or 1D page data, select page: 0, address: 10, and set data: 01, then sclect 3, 8, A, B, C or D page. The 13, 18, 1A, 1B, 1C or 1D page can be chosen by this data setting.
After reading or writing, reset the data or page: 0, address: 10 to "00".

2-2-1. Initialization of 8, 9, C, 13, 18, 1C, 1D Page Data

1. Initializing of 8, 9, C, 13, 18, 1C, 1D Page Data

Note1: If "Initialization of Pages 8, 9, C, 13, 18, 1C, 1D" is executed, all data on pages 8, 9, C, 13, 18, 1C, 1D are initialized. (Only an individual page cannot be initialized)

Note2 : If the 8, 9, C, 13, 18, 1C, 1D page data has been initialized, the following adjustments need to be performed again.
1) Modification of 8, 9, C, 13, 18, 1C, 1D page data
2) Node unique ID No. input
3) Servo, RF system adjustments
4) Video system adjustments

Adjustment Page	8
Adjustment Address	00 to FF
Adjustment Page	9
Adjustment Address	00 to FF
Adjustment Page	C
Adjustment Address	10 to FF
Adjustment Page	13
Adjustment Address	00 to FF
Adjustment Page	18
Adjustment Address	00 to FF
Adjustment Page	1C
Adjustment Address	00 to FF
Adjustment Page	1D
Adjustment Address	00 to FF

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	00	
3	3	81		Set the following data, and press PAUSE (Write) button. (Note 3) 00: Initializing all areas 01: Initializing other than adjustment address
4	3	80	0C	Press PAUSE (Write) button.
5	3	80		Check the data changes to "1C".
6				Press the RESET button at the rear panel of the unit using a thin and long pin.
7	3	76		Check the data is "00".
8				Perform "Modification of 8, 9, C, 18, 1C, 1D Page Data".

Note 3: If other than adjustment address was initialized, the adjusted data is not initialized.

2. Modification of 8, 9, C, 13, 18, 1C, 1D Page Data

If the 8, 9, C, 13, 18, 1C, 1D page data has been initialized, change the data of the "Fixed data-2" address shown in the following table by manual input.

Modifying Method:
1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) If modification of data on pages 8, 9, C, set data: 00 to page: 0, address: 10, and then select pages 8, 9, C.
3) If modification of data on pages 13, 18, 1C, 1D, set data: 01 to page: 0, address: 10, and then select pages 3, 8, C, D.
After the modification of data finished, return the data on page: 0, address: 10 to "00".
4) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
Note: If copy the data built in the different model, the camcorder may not operate.
5) When changing the data, press the PAUSE (Write) button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
6) If all areas were initialized, check that the data at the addresses for adjustment are initial values (adjustment initial values) listed in the table.
If different, change them to the adjustment initial values.

Processing after Completing Modification 8, 9, C, 13, 18, 1C, 1D page data:

Order	Page	Address	Data	Procedure
1	7	01	DB	
2	7	00	01	Press PAUSE (Write) button.
3	7	02		Check the data changes to "01".
4				Press the RESET button at the rear panel of the unit using a thin and long pin.

3. 8 Page table

Note 1: Check that the data of page: 0, address: 10 is"00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of 8, 9, C, 13, 18, 1C, 1D Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of 8, 9, C, 13, 18, 1C, 1D Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to 45			Fixed data-1 (Initialized data)
46			Fixed data-2
47, 48			Fixed data-1 (Initialized data)
49			Fixed data-2
4A			
4B to B1			Fixed data-1 (Initialized data)
B2			Fixed data-2
B3			
B4			Fixed data-1 (Initialized data)
B5			Fixed data-2
B6			
B7 to C1			Fixed data-1 (Initialized data)
C2			Fixed data-2
C3			Fixed data-1 (Initialized data)
C4			Fixed data-2
C5 to FF			Fixed data-1 (Initialized data)

4. 9 Page table

Note 1: Check that the data of page: 0, address: 10 is "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of 8, 9, C, 13, 18, 1C, 1D Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of 8, 9, C, 13, 18, 1C, 1D Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to FF			Fixed data-1 (Initialized data)

5. C Page table

Note 1: Check that the data of page: 0, address: 10 is "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of 8, 9, C, 13, 18, 1C, 1D Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of 8, 9, C, 13, 18, 1C, 1D Page Data")

Address	Initial value		Remark
	NTSC	PAL	
10	EE	EE	Switching position adj.
11	00	00	
12	00	00	
13	00	00	
14, 15			Fixed data-1 (Initialized data)
16	E0	E0	CAP FG duty adj.
17 to 42			Fixed data-1 (Initialized data)

Address	Initial value		Remark
	NTSC	PAL	
43			Fixed data-2
44			
45 to 5F			Fixed data-1 (Initialized data)
60			Fixed data-2
61 to 68			Fixed data-1 (Initialized data)
69			Fixed data-2
6A			
6B to 6D			Fixed data-1 (Initialized data)
6E			Fixed data-2
6F			
70 to 72			Fixed data-1 (Initialized data)
73			Fixed data-2
74, 75			Fixed data-1 (Initialized data)
76			Fixed data-2
77 to 89			Fixed data-1 (Initialized data)
8A	67	67	S VIDEO OUT Y level adj. (NTSC)
8B	53	53	S VIDEO OUT chroma level adj. (NTSC)
8C	69	69	
8D to 8F			Fixed data-1 (Initialized data)
90	67	67	S VIDEO OUT Y level adj. (PAL)
91	53	53	S VIDEO OUT chroma level adj. (PAL)
92	69	69	
93	79	79	COMPONENT OUT Y level adj. (D1 SMPTE)
94	31	31	COMPONENT OUT Pb level adj. (D1 SMPTE)
95	32	32	COMPONENT OUT Pr level adj. (D1 SMPTE)
96 to 98			Fixed data-1 (Initialized data)
99	67	67	COMPONENT OUT Y level adj. (D1 BETACAM)
9A	48	48	COMPONENT OUT Pb level adj. (D1 BETACAM)
9B	48	48	COMPONENT OUT Pr level adj. (D1 BETACAM)
9C to FF			Fixed data-1 (Initialized data)

6. 13 Page table

Note 1: If reading/writing data on pages 13, set data: 01 to page: 0, address: 10, and then select pages: 3. By this data setting, the pages 13 can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of 8, 9, C, 13, 18, 1C, 1D Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of 8, 9, C, 13, 18, 1C, 1D Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to 03	Fixed data-1 (Initialized data)		
04	08	08	Node unique ID No. input
05	00	00	
06	46	46	
07	01	01	
08	02	02	
09	00	00	
0A	00	00	
0B	00	00	
0C to 10	Fixed data-1 (Initialized data)		
11	Fixed data-2		
12			
13			
14 to 24	Fixed data-1 (Initialized data)		
25	Fixed data-2		
26 to C0	Fixed data-1 (Initialized data)		
C1	Fixed data-2		
C2 to C4	Fixed data-1 (Initialized data)		
C5	Fixed data-2		
C6 to CF	Fixed data-1 (Initialized data)		
D0	Fixed data-2		
D1 to FD	Fixed data-1 (Initialized data)		
FE	Fixed data-2		
FF	Fixed data-1 (Initialized data)		

7. 18 Page table

Note 1: If reading/writing data on pages 18, set data: 01 to page: 0, address: 10, and then select pages: 8. By this data setting, the pages 18 can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of 8, 9, C, 13, 18, 1C, 1D Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of 8, 9, C, 13, 18, 1C, 1D Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to 9B	Fixed data-1 (Initialized data)		
9C	Fixed data-2		
9D to EA	Fixed data-1 (Initialized data)		
EB	Fixed data-2		
EC			
ED to FF	Fixed data-1 (Initialized data)		

8. 1C Page table

Note 1: If reading/writing data on pages 1C, set data: 01 to page: 0, address: 10, and then select pages: C. By this data setting, the pages 1C can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to"00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of 8, 9, C, 13, 18, 1C, 1D Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of 8, 9, C, 13, 18, 1C, 1D Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to B2	Fixed data-1 (Initialized data)		
B3	00	00	Error rate check
B4	00	00	
B5	00	00	
B6	00	00	
B7	00	00	
B8	80	80	
B9	00	00	
BA	00	00	
BB	00	00	
BC	00	00	
BD	00	00	
BE	00	00	
BF	00	00	
C0	00	00	
C1	00	00	
C2	00	00	
C3	80	80	
C4	00	00	
C5	00	00	
C6	00	00	
C7	00	00	
C8	00	00	
C9 to DC	Fixed data-1 (Initialized data)		
DD	Fixed data-2		
DE			
DF to FF	Fixed data-1 (Initialized data)		

9. 1D Page table

Note 1: If reading/writing data on pages 1D, set data: 01 to page: 0, address: 10, and then select pages: D. By this data setting, the pages 1D can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of 8, 9, C, 13, 18, 1C, 1D Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of 8, 9, C, 13, 18, 1C, 1D Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to 4F	Fixed data-1 (Initialized data)		
50	Fixed data-2		
51 to FF	Fixed data-1 (Initialized data)		

2-2-2. Initialization of A, B, D, 1A, 1B Page Data

Note: Check that the data of page: 0, address: 10 is "00".

1. Initializing of A, B, D, 1A, 1B Page Data

Note 1: If the A, B, D, 1A, 1B page data has been initialized, the following adjustments need to be performed again.
1) Modification of A, B, D, 1A, 1B page data

Note 2: NTSC model: HVR-M15J/M15U/M15N
PAL model: HVR-M15E/M15P/M15C

Adjustment Page	A
Adjustment Address	10 to FF
Adjustment Page	B
Adjustment Address	00 to FF
Adjustment Page	D
Adjustment Address	10 to FF
Adjustment Page	1A
Adjustment Address	00 to FF
Adjustment Page	1B
Adjustment Address	00 to FF

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	00	
3	7	04		Set the following data 00: NTSC model 01: PAL model
4	7	01		Set the following data 20: Initializing A page 21: Initializing B page 22: Initializing D page 23: Initializing 1A page 24: Initializing 1B page 25: Initializing A and 1A page 26: Initializing B and 1B page 28: Initializing A, B, D, 1A and 1B page
5	7	02	FF	
6	7	00	01	Press PAUSE (Write) button.
7	7	02		Check the data changes to "01".
8				Perform "Modification of A, B, D, 1A, 1B Page Data"

Note 3: The order from 1 to 7 must be performed continuously without turning off the power.
If the power is turned off in the midway of work and then even if "E:20:00" is displayed at the next start of the set, the data on each page can be changed normally.

2. Modification of A, B, D, 1A, 1B Page Data

If the A, B, D, 1A, 1B page data has been initialized, change the data of the "Fixed data-2" address shown in the following table by manual input.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) If modification of data on pages A, B, D, set data: 00 to page: 0, address: 10, and then select pages A, B, D.
3) If modification of data on pages 1A, 1B, set data: 01 to page: 0, address: 10, and then select pages A, B.
   After the modification of data finished, return the data on page: 0, address: 10 to "00".
4) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note 1: If copy the data built in the different model, the camcorder may not operate.
5) When changing the data, press the PAUSE (Write) button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
6) Check that the data of adjustment addresses is the initial value. If not, change the data to the initial value.

Processing after Completing Modification A, B, D, 1A, 1B page data:

Order	Page	Address	Data	Procedure
1	7	01	DB	
2	7	00	01	Press PAUSE (Write) button.
3	7	02		Check the data changes to "01".
4				Press the RESET button at the rear panel of the unit using a thin and long pin.

Note 2: If following symptoms occur after completing of the "Modification A, B, D, 1A, 1B page data", check that the data of the "Fixed data-2" address of A, B, D, 1A, 1B page are same as those of same model of same destination.
1) The power is shut off so that unit cannot operate.

3. A Page table

Note 1: Check that the data of page: 0, address: 10 is"00".
Note 2: Fixed data-1: Initialized data. (Refer to"1. Initializing of A, B, D, 1A, 1B Page Data")
Fixed data-2: Modified data. (Refer to"2. Modification of A, B, D, 1A, 1B Page Data")

Address	Initial value		Remark
	NTSC	PAL	
10 to 17			Fixed data-1 (Initialized data)
18			Fixed data-2
19, 1A			Fixed data-1 (Initialized data)
1B			Fixed data-2
1C			
1D, 1E			Fixed data-1 (Initialized data)
1F			Fixed data-2
20 to 29			Fixed data-1 (Initialized data)
2A			Fixed data-2
2B			
2C to 2E			Fixed data-1 (Initialized data)
2F			Fixed data-2
30 to 32			Fixed data-1 (Initialized data)
33			Fixed data-2
34 to 3F			Fixed data-1 (Initialized data)
40			Fixed data-2
41 to 44			Fixed data-1 (Initialized data)
45			Fixed data-2
46 to 49			Fixed data-1 (Initialized data)
4A			Fixed data-2
4B			Fixed data-1 (Initialized data)
4C			Fixed data-2
4D, 4E			Fixed data-1 (Initialized data)
4F			Fixed data-2
50			Fixed data-1 (Initialized data)
51			Fixed data-2
52			Fixed data-1 (Initialized data)
53			Fixed data-2
54, 55			Fixed data-1 (Initialized data)
56			Fixed data-2
57			Fixed data-1 (Initialized data)
58			Fixed data-2
59			
5A, 5B			Fixed data-1 (Initialized data)
5C			Fixed data-2
5D to 7B			Fixed data-1 (Initialized data)
7C			Fixed data-2
7D			
7E			
7F			
80 to 9E			Fixed data-1 (Initialized data)
9F			Fixed data-2
A0 to C6			Fixed data-1 (Initialized data)

Address	Initial value		Remark
	NTSC	PAL	
C7			Fixed data-2
C8			
C9			
CA to CD			Fixed data-1 (Initialized data)
CE			Fixed data-2
CF to FF			Fixed data-1 (Initialized data)

4. B Page table

Note 1: Check that the data of page: 0, address: 10 is "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of A, B, D, 1A, 1B Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of A, B, D, 1A, 1B Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00	Fixed data-1 (Initialized data)		
01	Fixed data-2		
02	Fixed data-1 (Initialized data)		
03	Fixed data-2		
04 to F1	Fixed data-1 (Initialized data)		
F2	Fixed data-2		
F3 to FF	Fixed data-1 (Initialized data)		

5. D Page table

Note 1: Check that the data of page: 0, address: 10 is "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of A, B, D, 1A, 1B Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of A, B, D, 1A, 1B Page Data")

Address	Initial value		Remark
	NTSC	PAL	
10 to 15	Fixed data-1 (Initialized data)		
16	Fixed data-2		
17			
18 to 25	Fixed data-1 (Initialized data)		
26	Fixed data-2		
27 to 56	Fixed data-1 (Initialized data)		
57	Fixed data-2		
58 to79	Fixed data-1 (Initialized data)		
7A	Fixed data-2		
7B to FF	Fixed data-1 (Initialized data)		

6. 1A Page table

Note 1: If reading/writing data on pages 1A, set data: 01 to page: 0, address: 10, and then select pages: A. By this data setting, the pages 1A can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of A, B, D, 1A, 1B Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of A, B, D, 1A, 1B Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to 64	Fixed data-1 (Initialized data)		
65	Fixed data-2		
66 toFF	Fixed data-1 (Initialized data)		

7. 1B Page table

Note 1: If reading/writing data on pages 1B, set data: 01 to page: 0, address: 10, and then select pages: B. By this data setting, the pages 1B can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Note 2: Fixed data-1: Initialized data. (Refer to "1. Initializing of A, B, D, 1A, 1B Page Data")
Fixed data-2: Modified data. (Refer to "2. Modification of A, B, D, 1A, 1B Page Data")

Address	Initial value		Remark
	NTSC	PAL	
00 to FF	Fixed data-1 (Initialized data)		

2-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Node Unique ID No. Input

Note 1: Perform "1-2. Input of Serial No." if the data on page 13 has been cleared and original node unique ID No. is uncertain.
Usually, read the data on page 13 before repair, and write it after repair.

Note 2: If reading/writing data on pages 13, set data: 01 to page: 0, address: 10, and then select pages: 3. By this data setting, the pages 13 can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

1-1. Input of Company ID

Write the company ID to the EEPROM (nonvolatile memory).

Page	13
Address	04, 05, 06, 07, 08

Input method:

1) Select page: 0, address: 01, and set data: 01.
2) Select page: 0, address: 10, and set data: 01.
3) Select page: 3 (13), and enter the following data.

Note 3: Each time the data is set, press the PAUSE (Write) button on the adjusting remote commander.

Address	Data
04	08
05	00
06	46
07	01
08	02

4) Select page: 0, address: 10, and set data: 00.
5) Select page: 0, address: 01, and set data: 00.

1-2. Input of Serial No.

Write the serial No. and model code to the EEPROM (nonvolatile memory).
In writing the serial No., a decimal number should be converted into a hexadecimal number

Page	13
Address	09, 0A, 0B

1) Select page: 0, address: 01, and set data: 01.
2) Read the serial No. from the model name label, and it is assumed to be D_1.
   Example: If serial No. is "77881",
   $D_1 = 77881$
3) From Table 6-2-2, obtain D_2 and H_1 that correspond to D_1.
   Example: If $D_1 = 77881$,
   $D_2 = D_1 - 65536 = 12345$
   $H_1 = FE$

D_1 (decimal)	D_2 (decimal)	H_1 (hexadecimal) (Service model code)
00001 to 65535	D_1	FE
65536 to 131071	$D_1 - 65536$	FE
131072 to196607	$D_1 - 131072$	FE
196608 to 262143	$D_1 - 196608$	FE
262144 to 327679	$D_1 - 262144$	FE
327680 to 393215	$D_1 - 327680$	FE
393216 to 458751	$D_1 - 393216$	FE
458752 to 524287	$D_1 - 458752$	FE
524288 to 589823	$D_1 - 524288$	FE
589824 to 655359	$D_1 - 589824$	FE
655360 to 720895	$D_1 - 655360$	FE
720896 to 786431	$D_1 - 720896$	FE
786432 to 851967	$D_1 - 786432$	FE
851968 to 917503	$D_1 - 851968$	FE
917504 to 983039	$D_1 - 917504$	FE
983040 to 999999	$D_1 - 983040$	FE

Table 6-2-2

4) Enter H_1 to address: 09 on page: 13.
   Example: If $H_1 = FE$,
   Select page: 0, address: 10, and set data: 01.
   Select page: 3 (13), address: 09, and set data: FE, then press the PAUSE (Write) button.
5) From Table 6-2-3, obtain the maximum decimal number less than D_2, and it is assumed to be D_3.
   Example: If $D_2 = 12345$.
   $D_3 = 12288$
6) From Table 6-2-3, obtain a hexadecimal number that corresponds to D_3, and it is assumed to be H_3.
   Example: If $D_3 = 12288$,
   $H_3 = 3000$
7) Caluculate D_4 using following equations (decimal caluculation). ($0 \leqq D_4 \leqq 225$)
   $D_4 = D_2 - D_3$
   Example: If $D_2 = 12345$ and $D_3 = 12288$,
   $D_4 = 12345 - 12288 = 57$
8) Convert D_4 into a hexadecimal number to obtain H_4. (See Table 6-3-1 "Hexadecimal - decimal conversion table" in 6-3. Service Mode)
   Example: If $D_4 = 57$,
   $H_4 = 39$
9) Enter higher two digits of H_3 to address: 0A on page: 13.
   Example: If $H_3 = 3000$,
   Select page: 0, address: 10, and set data: 01.
   Select page: 3 (13), address: 0A, and set data: 30, then press the PAUSE (Write) button.
10) Enter H_4 to address: 0B on page: 13.
    Example: If $H_4 = 39$,
    Select page: 0, address: 10, and set data: 01.
    Select page: 3 (13), address: 0B, and set data: 39, then press the PAUSE (Write) button.
11) Select page: 0, address: 10, and set data: 00.
12) Select page: 0, address: 01, and set data: 00.

D_3	H_3	D_3	H_3	D_3	H_3	D_3	H_3	D_3	H_3	D_3	H_3	D_3	H_3	D_3	H_3
0	0000	8192	2000	16384	4000	24576	6000	32768	8000	40960	A000	49152	C000	57344	E000
256	0100	8448	2100	16640	4100	24832	6100	33024	8100	41216	A100	49408	C100	57600	E100
512	0200	8704	2200	16896	4200	25088	6200	33280	8200	41472	A200	49664	C200	57856	E200
768	0300	8960	2300	17152	4300	25344	6300	33536	8300	41728	A300	49920	C300	58112	E300
1024	0400	9216	2400	17408	4400	25600	6400	33792	8400	41984	A400	50176	C400	58368	E400
1280	0500	9472	2500	17664	4500	25856	6500	34048	8500	42240	A500	50432	C500	58624	E500
1536	0600	9728	2600	17920	4600	26112	6600	34304	8600	42496	A600	50688	C600	58880	E600
1792	0700	9984	2700	18176	4700	26368	6700	34560	8700	42752	A700	50944	C700	59136	E700
2048	0800	10240	2800	18432	4800	26624	6800	34816	8800	43008	A800	51200	C800	59392	E800
2304	0900	10496	2900	18688	4900	26880	6900	35072	8900	43264	A900	51456	C900	59648	E900
2560	0A00	10752	2A00	18944	4A00	27136	6A00	35328	8A00	43520	AA00	51712	CA00	59904	EA00
2816	0B00	11008	2B00	19200	4B00	27392	6B00	35584	8B00	43776	AB00	51968	CB00	60160	EB00
3072	0C00	11264	2C00	19456	4C00	27648	6C00	35840	8C00	44032	AC00	52224	CC00	60416	EC00
3328	0D00	11520	2D00	19712	4D00	27904	6D00	36096	8D00	44288	AD00	52480	CD00	60672	ED00
3584	0E00	11776	2E00	19968	4E00	28160	6E00	36352	8E00	44544	AE00	52736	CE00	60928	EE00
3840	0F00	12032	2F00	20224	4F00	28416	6F00	36608	8F00	44800	AF00	52992	CF00	61184	EF00
4096	1000	12288	3000	20480	5000	28672	7000	36864	9000	45056	B000	53248	D000	61440	F000
4352	1100	12544	3100	20736	5100	28928	7100	37120	9100	45312	B100	53504	D100	61696	F100
4608	1200	12800	3200	20992	5200	29184	7200	37376	9200	45568	B200	53760	D200	61952	F200
4864	1300	13056	3300	21248	5300	29440	7300	37632	9300	45824	B300	54016	D300	62208	F300
5120	1400	13312	3400	21504	5400	29696	7400	37888	9400	46080	B400	54272	D400	62464	F400
5376	1500	13568	3500	21760	5500	29952	7500	38144	9500	46336	B500	54528	D500	62720	F500
5632	1600	13824	3600	22016	5600	30208	7600	38400	9600	46592	B600	54784	D600	62976	F600
5888	1700	14080	3700	22272	5700	30464	7700	38656	9700	46848	B700	55040	D700	63232	F700
6144	1800	14336	3800	22528	5800	30720	7800	38912	9800	47104	B800	55296	D800	63488	F800
6400	1900	14592	3900	22784	5900	30976	7900	39168	9900	47360	B900	55552	D900	63744	F900
6656	1A00	14848	3A00	23040	5A00	31232	7A00	39424	9A00	47616	BA00	55808	DA00	64000	FA00
6912	1B00	15104	3B00	23296	5B00	31488	7B00	39680	9B00	47872	BB00	56064	DB00	64256	FB00
7168	1C00	15360	3C00	23552	5C00	31744	7C00	39936	9C00	48128	BC00	56320	DC00	64512	FC00
7424	1D00	15616	3D00	23808	5D00	32000	7D00	40192	9D00	48384	BD00	56576	DD00	64768	FD00
7680	1E00	15872	3E00	24064	5E00	32256	7E00	40448	9E00	48640	BE00	56832	DE00	65024	FE00
7936	1F00	16128	3F00	24320	5F00	32512	7F00	40704	9F00	48896	BF00	57088	DF00	65280	FF00

Note: D_3: Decimal
H_3: Hexadecimal

Table 6-2-3

2-4. SERVO AND RF SYSTEM ADJUSTMENTS

Before perform the servo and RF system adjustments, check that the specified values of "Origin Oscillation check" of "2-5. VIDEO SYSTEM ADJUSTMENTS" is satisfied.
Check that the data of page: 0, address: 10 is "00". If not, select page: 0, address: 10, and set the data "00".

Adjusting Procedure:
1. CAP FG duty adjustment
2. Switching position adjustment
3. Error rate check

1. CAP FG Duty Adjustment (VD-036 board)

RadarW

Set the CAP FG signal duty cycle to 50% to establish an appropriate capstan servo. If deviated, the uneven rotation of capstan and noise can occur.

Mode	E-E
Signal	No signal
Measurement Point	Displayed data of page: 3, address: 03
Measuring Instrument	Adjusting remote commander
Adjustment Page	C
Adjustment Address	16
Specified value	The data of page: 3, address: 03 is "00"

Note 1: Check that the data of page: 0, address: 10 is "00".

Adjusting method:

Order	Page	Address	Data	Procedure
1				Close the cassette compartment without inserting cassette.
2	0	01	01	
3	3	03	FF	
4	3	01	1B	Press PAUSE (Write) button.
5	3	02		Check the data changes in the following order "1B" → "2B" → "00"
6	3	03		Check the data is "00". (Note 2)
7	0	01	00	

Note 2: If the data is "01", adjustment has errors or the mechanism deck is defective.
If the data is "80", the mechanism deck is in emergency state or the end of tape was detected.

2. Switching Position Adjustment (VD-036 board)

RadarW

Mode	Playback
Signal	SW/OL standard (XH2-3)
Measurement Point	Displayed data of page: 3, address: 03
Measuring Instrument	Adjusting remote commander
Adjustment Page	C
Adjustment Address	10, 11, 12, 13
Specified value	The data of page: 3, address: 03 is “00”

Note 1: Check that the data of page: 0, address: 10 is “00”.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Insert the SW/OL standard tape and enter the VTR stop mode.
2	0	01	01	
3	C	10	EE	Press PAUSE (Write) button.
4	3	03	FF	
5	3	21		Check the data is “52”. (Note 2)
6	3	01	0D	Press PAUSE (Write) button.
7	3	02		Check the data changes to “00”.
8	3	03		Check the data is “00”. (Note 3)
9	0	01	00	

Note 2: If the data is “92”, the tape top being played. After playing the tape for 1 to 2 seconds, stop it, perform step 5 and higher.
If the data is “82”, the tape end being played. After rewind the tape, perform step 5 and higher.

Note 3: If bit0 of the data is “1”, the EVEN channel is defective.
If bit1 of the data is “1”, the ODD channel is defective.
Contents of the defect is see written into page: C, address: 10 and 12. See following table.
(For the bit values, refer to “6-3. SERVICE MODE”, “3-4. 4. Bit value discrimination”.)
If bit3 of the data is “1”, the tape end being played, so rewind the tape and perform the adjustment again.

When the EVEN channel is defective

Data of page: C, address: 10	Contents of defect
EE	Writing into EEP ROM (IC5001) is defective
E8	Adjustment data is out of range
E7	No data is returned from IC3001

When the ODD channel is defective

Data of page: C, address: 12	Contents of defect
EE	Writing into EEP ROM (IC5001) is defective
E8	Adjustment data is out of range
E7	No data is returned from IC3001

3. Error Rate Check (VD-036 board) RadarW

Note: Check that the data of page: 0, address: 10 is "00".

3-1. Preparations before adjustments

Mode	Recording
Signal	Arbitrary (color bar etc.)

Switch setting

1) HDV/DV SEL (IN/OUT REC menu) .... DV

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	01	
3	C (1C)	0D	CC	Press PAUSE (Write) button.
4	0	10	00	
5				Record the input signal for 2 minutes.

3-2. Error Rate Check

Mode	Playback
Signal	Recorded signal at "Preparations before adjustments"
Measurement Point	Displayed data of page: 3, address: 03
Measuring Instrument	Adjusting remote commander
Adjustment Page	1C
Adjustment Address	B3 to C8
Specified value	The data of page: 3, address: 03 is "00"

Note 1: If reading/writing data on pages 1C, set data: 01 to page: 0, address: 10, and then select pages: C. By this data setting, the pages 1C can be selected.
After the data reading/writing finished, return the data on page: 0, address: 10 to "00".

Initial Value of Page 1C: Address: B3 to C8

Address	Initial value	Address	Initial value	Address	Initial value
B3	00	BB	00	C3	80
B4	00	BC	00	C4	00
B5	00	BD	00	C5	00
B6	00	BE	00	C6	00
B7	00	BF	00	C7	00
B8	80	C0	00	C8	00
B9	00	C1	00		
BA	00	C2	00		

Table 6-2-4

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2				Check that the data of page: 1C, address: B3 to C8 is the initial value. (See Table 6-2-4)
3				Playback the recorded signal at "Preparations before adjustments".
4	3	03	FF	
5	3	01	40	Press PAUSE (Write) button.
6	3	02		Check the data changes to "00".
7	3	03		Check the data is "00". (Note 2)
8				Perform "Processing after Completing Adjustments".

Note 2: If the data is other than "00", Error rate is abnormal. For the contents of the abnormality, see the following table.

Data of page: 3, address: 03	Contents of defect
01	EVEN channel is abnormal.
02	ODD channel is abnormal.
03	EVEN channel and ODD channel are abnormal.

Note 3: If Error rate is abnormal, Check the use tape, clean the tape running surface. And after inputting initial values to page 1C: address: B3 to C8, perform re-adjustment. (See Table 6-2-4)

Processing after Completing Adjustment:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	01	
3	C (1C)	0D	00	Press PAUSE (Write) button.
4	0	10	00	
5	0	01	00	

2-5. VIDEO SYSTEM ADJUSTMENTS

Before perform the video system adjustments, check that the data of page: 0, address: 10 is “00”.
If not, select page: 0, address: 10, and set the data “00”.

Adjusting Procedure:

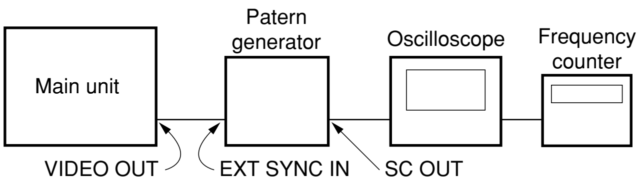
1) Origin oscillation check
2) S VIDEO OUT Y level adjustment
3) S VIDEO OUT chroma level adjustment
4) VIDEO OUT level check
5) VIDEO OUT level check (E-E)
6) COMPONENT OUT Y level adjustment (D1 SMPTE)
7) COMPONENT OUT Pb level adjustment (D1 SMPTE)
8) COMPONENT OUT Pr level adjustment (D1 SMPTE)
9) COMPONENT OUT Y level adjustment (D1 BETACAM)
10) COMPONENT OUT Pb level adjustment (D1 BETACAM)
11) COMPONENT OUT Pr level adjustment (D1 BETACAM)

1. Origin Oscillation Check (VD-036 board)

Check the frequency of the clock for synchronization.
If deviated, the synchronization will be disrupted and the color will become inconsistent.

Mode	E-E
Signal	No signal
Measurement Point	VIDEO OUT jack
Measuring Instrument	Pattern generator (External synchronization mode) Oscilloscope Frequency counter (Note)
Specified Value	f = 3579545 ± 72 Hz (NTSC) f = 4433619 ± 89 Hz (PAL)

Note: Connection of equipment



Checking method:

1) Set the 60i/50i SEL (OTHERS menu) to “60i”.
2) Check that the frequency (f) satisfies the NTSC specified value.
3) Set the 60i/50i SEL (OTHERS menu) to “50i”.
4) Check that the frequency (f) satisfies the PAL specified value.

2. S VIDEO, VIDEO OUT Adjustment

2-1. Preparations

Perform the following data setting before the “S VIDEO, VIDEO OUT Adjustment”.

Switch setting

1) DISPLAY OUTPUT switch .... OFF

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	01	
3	8 (18)	00	01	Press PAUSE (Write) button.
4	8 (18)	01	60	Press PAUSE (Write) button.
5	C (1C)	0F	10	Press PAUSE (Write) button.
6	8 (18)	06	55	Press PAUSE (Write) button.
7	8 (18)	04	C0	Press PAUSE (Write) button.
8	0	10	00	
9				Wait for 5 sec.
10	0	FF	3E	
11	B	00	02	
12	C	85		Check the data is “55”.
13	B	00	00	
14	0	FF	00	

2-2. S VIDEO OUT Y Level Adjustment (VD-036 board)

Mode	E-E
Signal	No signal
Measurement Point	Y signal terminal of S VIDEO OUT jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	8A (NTSC) 90 (PAL)
Specified value	A = 1000 ± 14 mVp-p

Adjusting method:

Order	Page	Address	Data	Procedure
1				Perform “Preparations”.
2				Set the HOLD switch of adjustment remote commander to “OFF” (NORMAL position).
3				Set the 60i/50i SEL (OTHERS menu) to “60i”.
4				Set the HOLD switch of adjustment remote commander to “HOLD” (SERVICE position).
5	C	8A		Change the data and set the Y signal level (A) to the NTSC specified value.
6	C	8A		Press PAUSE (Write) button.
7				Set the HOLD switch of adjustment remote commander to “OFF” (NORMAL position).
8				Set the 60i/50i SEL (OTHERS menu) to “50i”.
9				Set the HOLD switch of adjustment remote commander to “HOLD” (SERVICE position).
10	C	90		Change the data and set the Y signal level (A) to the PAL specified value.
11	C	90		Press PAUSE (Write) button.
12				Perform “Processing after Complete Adjustment”.

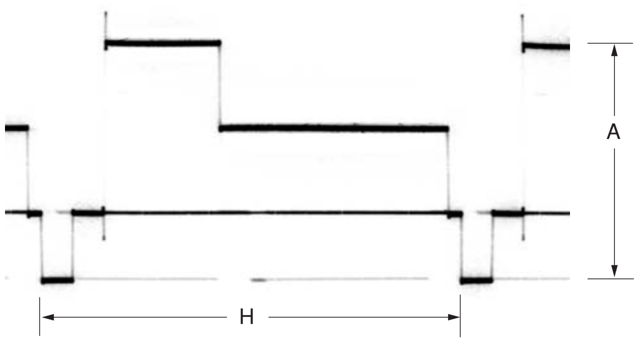


Fig. 6-2-3

2-3. S VIDEO OUT Chroma Level Adjustment (VD-036 board)

Mode	E-E
Signal	No signal
Measurement Point	Chroma signal terminal of S VIDEO OUT jack (75 Ω terminated) External trigger: Y signal terminal of S VIDEO OUT jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	8B, 8C (NTSC) 91, 92 (PAL)
Specified value	Cr level: A = 714 ± 14 mVp-p (NTSC) A = 700 ± 14 mVp-p (PAL) Cb level: B = 714 ± 14 mVp-p (NTSC) B = 700 ± 14 mVp-p (PAL) Burst level: C = 286 ± 6 mVp-p (NTSC) C = 300 ± 6 mVp-p (PAL)

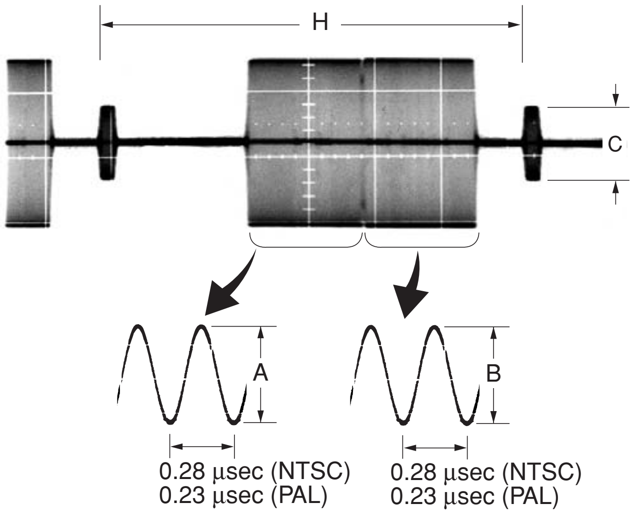


Fig. 6-2-4

Adjusting method:

Order	Page	Address	Data	Procedure
1				Perform “Preparations”.
2				Set the HOLD switch of adjustment remote commander to “OFF” (NORMAL position).
3				Set the 60i/50i SEL (OTHERS menu) to “60i”.
4				Set the HOLD switch of adjustment remote commander to “HOLD” (SERVICE position).
5	C	8B		Change the data and set the Cr signal level (A) to the NTSC specified value.
6	C	8B		Press PAUSE (Write) button.
7	C	8C		Change the data and set the Cb signal level (B) to the NTSC specified value.
8	C	8C		Press PAUSE (Write) button.
9				Check the burst signal (C) to the NTSC specified value.
10				Set the HOLD switch of adjustment remote commander to “OFF” (NORMAL position).
11				Set the 60i/50i SEL (OTHERS menu) to “50i”.
12				Set the HOLD switch of adjustment remote commander to “HOLD” (SERVICE position).
13	C	91		Change the data and set the Cr signal level (A) to the PAL specified value.
14	C	91		Press PAUSE (Write) button.
15	C	92		Change the data and set the Cb signal level (B) to the PAL specified value.
16	C	92		Press PAUSE (Write) button.
17				Check the burst signal (C) to the PAL specified value.
18				Perform “Processing after Complete Adjustment”.

2-4. VIDEO OUT Level Check (VD-036 board)

Mode	E-E
Signal	No signal
Measurement Point	VIDEO OUT jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Specified value	Sync level: A = 286 ± 18 mVp-p (NTSC) A = 300 ± 18 mVp-p (PAL) Burst level: B = 286 ± 18 mVp-p (NTSC) B = 300 ± 18 mVp-p (PAL)

Checking method:

Order	Page	Address	Data	Procedure
1				Perform “Preparations”.
2				Set the HOLD switch of adjustment remote commander to “OFF” (NORMAL position).
3				Set the 60i/50i SEL (OTHERS menu) to “60i”.
4				Check the sync signal level (A) to the NTSC specified value.
5				Check the burst signal level (B) to the NTSC specified value.
6				Set the 60i/50i SEL (OTHERS menu) to “50i”.
7				Check the sync signal level (A) to the PAL specified value.
8				Check the burst signal level (B) to the PAL specified value.
9				Set the HOLD switch of adjustment remote commander to “HOLD” (SERVICE position).
10				Perform “Processing after Complete Adjustment”.

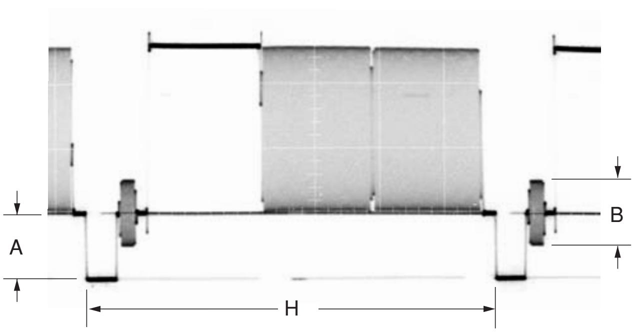


Fig. 6-2-5

2-5. Processing after Complete Adjustment

Perform the setting through the procedure mentioned below when you finish the “S VIDEO, VIDEO OUT Adjustment”.

Order	Page	Address	Data	Procedure
1	0	10	01	
2	C (1C)	0F	00	Press PAUSE (Write) button.
3	8 (18)	04	80	Press PAUSE (Write) button.
4	8 (18)	00	00	Press PAUSE (Write) button.
5	8 (18)	01	00	Press PAUSE (Write) button.
6	8 (18)	06	00	Press PAUSE (Write) button.
7	0	10	00	
8	0	01	00	

3. VIDEO OUT Level Check (E-E) (VD-036 board)

Mode	E-E
Signal	Color bar (VIDEO IN jack)
Measurement Point	VIDEO OUT jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Specified value	Sync level: A = 286 ± 18 mVp-p(NTSC) A = 300 ± 18 mVp-p(PAL) Burst level: B = 286 ± 18 mVp-p(NTSC) B = 300 ± 18 mVp-p(PAL)

Switch setting
1) DISPLAY OUTPUT switch .... OFF
2) INPUT SELECT switch .... VIDEO

Checking method:
1) Enter the color bar signal to VIDEO IN jack.
2) Set the 60i/50i SEL (OTHERS menu) to "60i".
3) Check the sync signal level (A) to the NTSC specified value.
4) Check the burst signal level (B) to the NTSC specified value.
5) Set the 60i/50i SEL (OTHERS menu) to "50i".
6) Check the sync signal level (A) to the PAL specified value.
7) Check the burst signal level (B) to the PAL specified value.

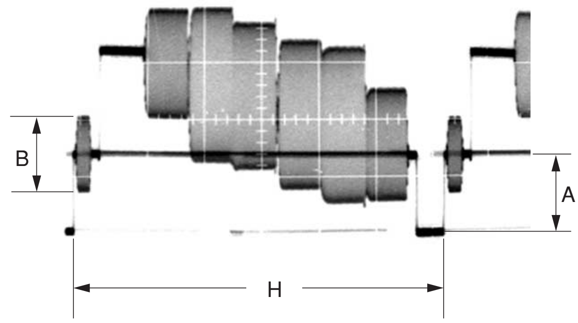


Fig. 6-2-6

4. COMPONENT OUT Adjustment (D1 SMPTE)

4-1. Preparations

Perform the following data setting before the "COMPONENT OUT Adjustment (D1 SMPTE)".

Switch setting
1) DISPLAY OUTPUT switch .... OFF
2) INPUT SELECT switch .... VIDEO (except DV)
3) HDV/DV SEL (IN/OUT REC menu) .... HDV
4) HDMI/CMPNT (IN/OUT REC menu) 480i
5) DOWN CONVERT (IN/OUT REC menu) ... SQUEEZE

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	01	
3	3 (13)	CF		Set the bit value of bit0 is "1", and press PAUSE button. (Note)
4	8 (18)	00		Set the bit value of bit7 is "1", and press PAUSE button. (Note)
5	0	10	00	
6	8	00		Set the bit value of bit1 is "1", and press PAUSE button. (Note)
7				Wait for 5 sec.

Note: For the bit values, refer to "6-3. SERVICE MODE", "3-4. 4. Bit value discrimination".

4-2. COMPONENT OUT Y Level Adjustment (D1 SMPTE) (VD-036 board)

Mode	E-E
Signal	No Signal
Measurement Point	Y terminal of COMPONENT OUT jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	93
Specified value	Y level: A = 1000 ± 10 mVp-p Sync level: B = 300 ± 10 mVp-p

Adjusting method:

Order	Page	Address	Data	Procedure
1				Perform “Preparations”.
2	C	93		Change the data and set the Y signal level (A) to the specified value.
3	C	93		Press PAUSE (Write) button.
4				Check the sync signal level (B) to the specified value.
5				Perform “Processing after Complete Adjustment”.

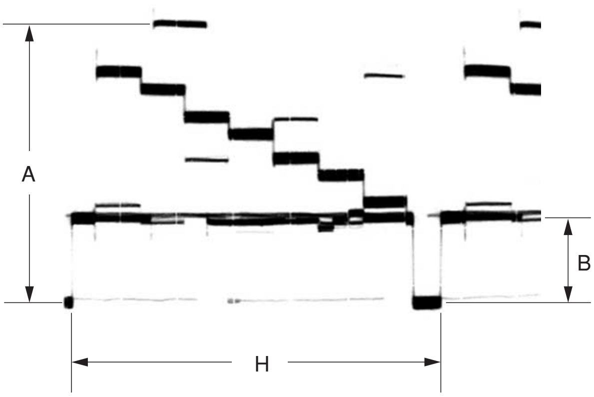


Fig. 6-2-7

4-3. COMPONENT OUT Pb Level Adjustment (D1 SMPTE) (VD-036 board)

Mode	E-E
Signal	No Signal
Measurement Point	Pb/Cb terminal of COMPONENT OUT jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	94
Specified value	Pb level: A = 525 ± 10 mVp-p

Adjusting method:

Order	Page	Address	Data	Procedure
1				Perform “Preparations”.
2	C	94		Change the data and set the Pb signal level (A) to the specified value.
3	C	94		Press PAUSE (Write) button.
4				Perform “Processing after Complete Adjustment”.

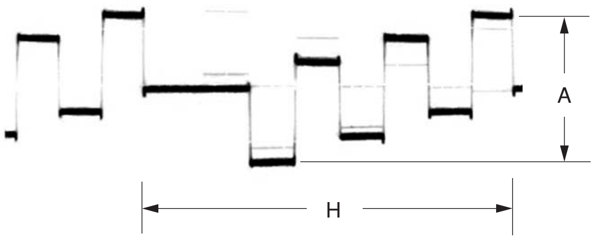


Fig. 6-2-8

4-4. COMPONENT OUT Pr Level Adjustment (D1 SMPTE) (VD-036 board)

Mode	E-E
Signal	No Signal
Measurement Point	Pr/Cr terminal of COMPONENT OUT jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	95
Specified value	Pr level: A = 525 ± 10 mVp-p

Adjusting method:

Order	Page	Address	Data	Procedure
1				Perform “Preparations”.
2	C	95		Change the data and set the Pr signal level (A) to the specified value.
3	C	95		Press PAUSE (Write) button.
4				Perform “Processing after Complete Adjustment”.

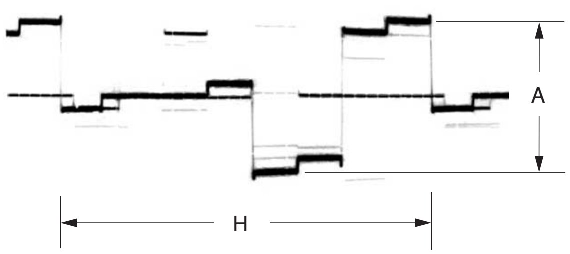


Fig. 6-2-9

4-5. Processing after Complete Adjustment

Perform the setting through the procedure mentioned below when you finish the “COMPONENT OUT Adjustment (D1 SMPTE)”.

Order	Page	Address	Data	Procedure
1	8	00		Set the bit value of bit1 is “0”, and press PAUSE button. (Note)
2	0	10	01	
3	8 (18)	00		Set the bit value of bit7 is “0”, and press PAUSE button. (Note)
4	3 (13)	CF		Set the bit value of bit0 is “0”, and press PAUSE button. (Note)
5	0	10	00	
6	0	01	00	

Note: For the bit values, refer to “6-3. SERVICE MODE”, “3-4. 4. Bit value discrimination”.

5. COMPONENT OUT Adjustment (D1 BETACAM)

5-1. Preparations

Perform the following data setting before the "COMPONENT OUT Adjustment (D1 BETACAM)".

Switch setting

1) DISPLAY OUTPUT switch .... OFF
2) INPUT SELECT switch .... VIDEO (except DV)
3) HDV/DV SEL (IN/OUT REC menu) .... HDV
4) HDMI/CMPNT (IN/OUT REC menu) 480i
5) DOWN CONVERT (IN/OUT REC menu) ... SQUEEZE

Order	Page	Address	Data	Procedure
1	0	01	01	
2	0	10	01	
3	3 (13)	CF		Set the bit value of bit1 is "1", and press PAUSE button. (Note)
4	8 (18)	00		Set the bit value of bit7 is "1", and press PAUSE button. (Note)
5	0	10	00	
6	8	00		Set the bit value of bit1 is "1", and press PAUSE button. (Note)
7				Wait for 5 sec.

Note: For the bit values, refer to "6-3. SERVICE MODE", "3-4. 4. Bit value discrimination".

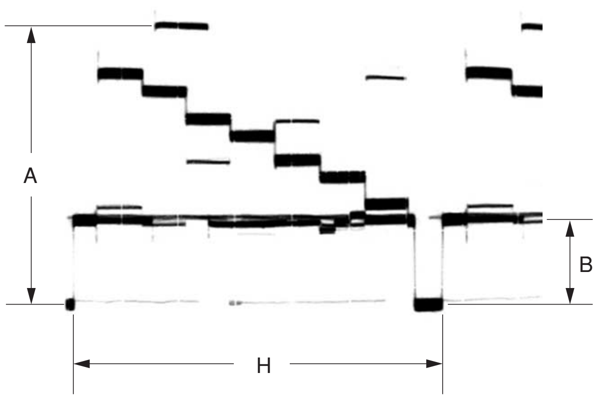


Fig. 6-2-10

5-2. COMPONENT OUT Y Level Adjustment (D1 BETACAM) (VD-036 board)

Mode	E-E
Signal	No Signal
Measurement Point	Y terminal of COMPONENT OUT jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	99
Specified value	Y level: A = 1000 ± 10 mVp-p Sync level: B = 286 ± 10 mVp-p (NTSC) B = 300 ± 10 mVp-p (PAL)

Adjusting method:

Order	Page	Address	Data	Procedure
1				Perform "Preparations".
2				Set the HOLD switch of adjustment remote commander to "OFF" (NORMAL position).
3				Set the 60i/50i SEL (OTHERS menu) to "60i".
4				Set the HOLD switch of adjustment remote commander to "HOLD" (SERVICE position).
5	C	99		Change the data and set the Y signal level (A) to the specified value.
6	C	99		Press PAUSE (Write) button.
7				Check the sync signal level (B) to the NTSC specified value.
8				Set the HOLD switch of adjustment remote commander to "OFF" (NORMAL position).
9				Set the 60i/50i SEL (OTHERS menu) to "50i".
10				Check the Y signal level (A) to the specified value.
11				Check the sync signal level (B) to the PAL specified value.
12				Set the HOLD switch of adjustment remote commander to "HOLD" (SERVICE position).
13				Perform "Processing after Complete Adjustment".

5-3. COMPONENT OUT Pb Level Adjustment (D1 BETACAM) (VD-036 board)

Mode	E-E
Signal	No Signal
Measurement Point	Pb/Cb terminal of COMPONENT OUT jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	9A
Specified value	Pb level: A = 756 ± 10 mVp-p

Adjusting method:

Order	Page	Address	Data	Procedure
1				Perform “Preparations”.
2				Set the HOLD switch of adjustment remote commander to “OFF” (NORMAL position).
3				Set the 60i/50i SEL (OTHERS menu) to “60i”.
4				Set the HOLD switch of adjustment remote commander to “HOLD” (SERVICE position).
5	C	9A		Change the data and set the Pb signal level (A) to the specified value.
6	C	9A		Press PAUSE (Write) button.
7				Set the HOLD switch of adjustment remote commander to “OFF” (NORMAL position).
8				Set the 60i/50i SEL (OTHERS menu) to “50i”.
9				Check the Pb signal level (A) to the specified value.
10				Set the HOLD switch of adjustment remote commander to “HOLD” (SERVICE position).
11				Perform “Processing after Complete Adjustment”.

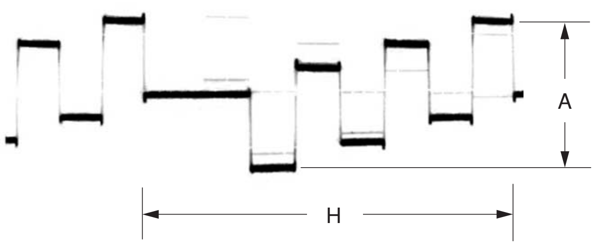


Fig. 6-2-11

5-4. COMPONENT OUT Pr Level Adjustment (D1 BETACAM) (VD-036 board)

Mode	E-E
Signal	No Signal
Measurement Point	Pr/Cr terminal of COMPONENT OUT jack (75 Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	9B
Specified value	Pr level: A = 756 ± 10 mVp-p

Adjusting method:

Order	Page	Address	Data	Procedure
1				Perform “Preparations”.
2				Set the HOLD switch of adjustment remote commander to “OFF” (NORMAL position).
3				Set the 60i/50i SEL (OTHERS menu) to “60i”.
4				Set the HOLD switch of adjustment remote commander to “HOLD” (SERVICE position).
5	C	9B		Change the data and set the Pr signal level (A) to the specified value.
6	C	9B		Press PAUSE (Write) button.
7				Set the HOLD switch of adjustment remote commander to “OFF” (NORMAL position).
8				Set the 60i/50i SEL (OTHERS menu) to “50i”.
9				Check the Pr signal level (A) to the specified value.
10				Set the HOLD switch of adjustment remote commander to “HOLD” (SERVICE position).
11				Perform “Processing after Complete Adjustment”.

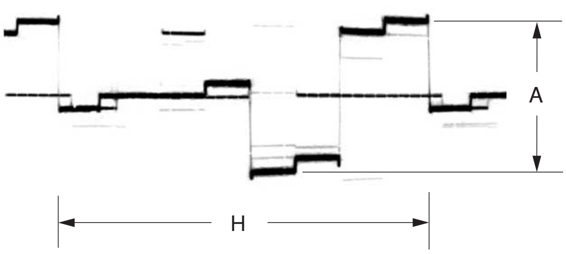


Fig. 6-2-12

5-5. Processing after Complete Adjustment

Perform the setting through the procedure mentioned below when you finish the "COMPONENT OUT Adjustment (D1 BETACAM)".

Order	Page	Address	Data	Procedure
1	8	00		Set the bit value of bit1 is "0", and press PAUSE button. (Note)
2	0	10	01	
3	8 (18)	00		Set the bit value of bit7 is "0", and press PAUSE button. (Note)
4	3 (13)	CF		Set the bit value of bit1 is "0", and press PAUSE button. (Note)
5	0	10	00	
6	0	01	00	

Note: For the bit values, refer to "6-3. SERVICE MODE", "3-4. 4. Bit value discrimination".

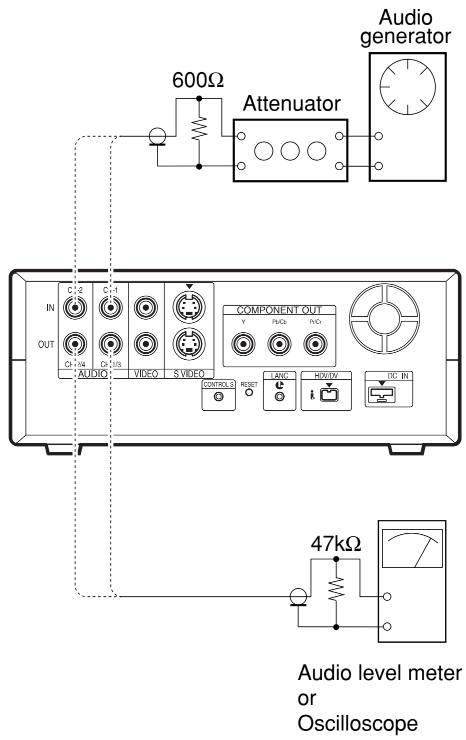
2-6. AUDIO SYSTEM ADJUSTMENTS

Set the switches and menu to the following position unless otherwise specified.

Switch setting

1) INPUT SELECT switch .... VIDEO (except HDV/DV)
2) AUDIO MODE (AUDIO SET menu) FS48K
3) AUDIO AGC (AUDIO SET menu) .... OFF
4) AUDIO REC LV (AUDIO SET menu) .... 0 dB
5) AUDIO MIX (AUDIO SET menu) CH-1, CH-2

Connection of equipment



600Ω : 270 (1-249-410-11) + 330 (1-249-411-11)
47kΩ : 1-249-437-11

Fig. 6-2-13

1. Playing Level Check

Mode	PLAY
Signal	Alignment tape: For audio check (NTSC: XH5-3/PAL: XH5-3P)
Measurement Point	AUDIO OUT terminal (CH-1, 2)
Measuring instrument	Audio level meter Oscilloscope
Specified Value	32 kHz mode section: 1 kHz signal must be outputted. 48 kHz mode section: 1 kHz signal level is +8 to +12 dBs (NTSC) +6 to +10 dBs (PAL) 44.1 kHz mode EMP ON section: 7.35 kHz signal level is +2 to +6 dBs (NTSC) 0 to +4 dBs (PAL) 44.1 kHz mode EMP OFF section: 7.35 kHz signal level is +8 to +12 dBs (NTSC) +6 to +10 dBs (PAL)

Note: 0 dBs = 0.775 Vrms

Checking method:

1) Check that the play signal level satisfies the specified value.
2) Check with the oscilloscope that no clip is found in the output waveform.

2. Audio Test Signal Level Check

Mode	E-E
Signal	Audio test signal
Measurement Point	AUDIO OUT terminal (CH-1, 2)
Measuring instrument	Audio level meter Oscilloscope
Specified Value	–11 to –8.5 dBs

Note 1: 0 dBs = 0.775 Vrms

Switch setting
1) COLOR BAR (IN/OUT REC menu) .... ON [TONE]

Checking method:
1) Set the 60i/50i SEL (OTHERS menu) to "60i".
2) Check that the output of AUDIO OUT terminal (CH-1, 2) satisfies the specified value.
3) Check with the oscilloscope that no clip is found in the output waveform.
4) Set the 60i/50i SEL (OTHERS menu) to "50i".
5) Check that the output of AUDIO OUT terminal (CH-1, 2) satisfies the specified value.
6) Check with the oscilloscope that no clip is found in the output waveform.
7) Set the 60i/50i SEL (OTHERS menu) to "50i" or "60i".
   Note 2: 60i: HVR-M15J/M15U/M15N
   50i: HVR-M15E/M15P/M15C

3. E-E Level Check

Mode	E-E
Signal	Audio: 1 kHz, –4 dBs signal AUDIO IN terminal (CH-1, 2)
Measurement Point	AUDIO OUT terminal (CH-1, 2)
Measuring instrument	Audio level meter Oscilloscope
Specified Value	REC LEVEL: 0 dB –8 to –4 dBs REC LEVEL: –6 dB –7 to –5 dB from the REC LEVEL: 0 dB REC LEVEL: +6 dB +5 to +7 dB from the REC LEVEL: 0 dB

Note: 0 dBs = 0.775 Vrms

Switch setting
1) AUDIO MODE (AUDIO SET menu) FS48K

Checking method:
1) Enter 1 kHz, –4 dBs signal to the AUDIO IN terminal (CH-1, 2).
2) Set the AUDIO REC LV (AUDIO SET menu) to "0 db". (REC LEVEL: 0 dB)
3) Check that the output of AUDIO OUT terminal (CH-1, 2) satisfies the specified value.
4) Check with the oscilloscope that no clip is found in the output waveform.
5) Set the AUDIO REC LV (AUDIO SET menu) to "–6 db". (REC LEVEL: –6 dB)
6) Check that the output of AUDIO OUT terminal (CH-1, 2) satisfies the specified value.
7) Set the AUDIO REC LV (AUDIO SET menu) to "+6 db". (REC LEVEL: +6 dB)
8) Check that the output of AUDIO OUT terminal (CH-1, 2) satisfies the specified value.

4. Frequency Characteristic Check

(1) 4CH mode Check

Mode	E-E
Signal	Audio: 1 kHz, –4 dBs signal 20 Hz, –4 dBs signal 14 kHz, –4 dBs signal AUDIO IN terminal (CH-1, 2)
Measurement Point	AUDIO OUT terminal (CH-1, 2)
Measuring instrument	Audio level meter Oscilloscope
Specified Value	Difference in output level: A = –2 to 0 dB B = –1.5 to +1.5 dB

Note: 0 dBs = 0.775 Vrms

Switch setting

1) AUDIO MODE (AUDIO SET menu) FS32K

Checking method:

1) Enter 1 kHz, –4 dBs signal to the AUDIO IN terminal (CH-1).
2) Measure the output of AUDIO OUT terminal (CH-1) at this time, and assume it to be “a” (dBs).
3) Enter 20 Hz, –4 dBs signal to the AUDIO IN terminal (CH-1).
4) Measure the output of AUDIO OUT terminal (CH-1) at this time, and assume it to be “b” (dBs).
5) Check with the oscilloscope that no clip is found in the output waveform.
6) Enter 14 kHz, –4 dBs signal to the AUDIO IN terminal (CH-1).
7) Measure the output of AUDIO OUT terminal (CH-1) at this time, and assume it to be “c” (dBs).
8) Check with the oscilloscope that no clip is found in the output waveform.
9) Calculate the difference A (dB) between output levels “b” (dBs) and “a” (dBs) to check that it satisfies the specified value.
   A (dB) = b (dBs) – a (dBs)
10) Calculate the difference B (dB) between output levels “c” (dBs) and “a” (dBs) to check that it satisfies the specified value.
   B (dB) = c (dBs) – a (dBs)
11) For the CH-2, make a checking in the same manner.

(2) 2CH mode Check

Mode	E-E
Signal	Audio: 1 kHz, –4 dBs signal 20 kHz, –4 dBs signal AUDIO IN terminal (CH-1, 2)
Measurement Point	AUDIO OUT terminal (CH-1, 2)
Measuring instrument	Audio level meter Oscilloscope
Specified Value	Difference in output level: A = –1.5 to +1.5 dB

Note: 0 dBs = 0.775 Vrms

Switch setting

1) AUDIO MODE (AUDIO SET menu) FS32K

Checking method:

1) AUDIO MODE (AUDIO SET menu) FS48K

Checking method:

1) Enter 1 kHz, –4 dBs signal to the AUDIO IN terminal (CH-1).
2) Measure the output of AUDIO OUT terminal (CH-1) at this time, and assume it to be “a” (dBs).
3) Enter 20 kHz, –4 dBs signal to the AUDIO IN terminal (CH-1).
4) Measure the output of AUDIO OUT terminal (CH-1) at this time, and assume it to be “b” (dBs).
5) Check with the oscilloscope that no clip is found in the output waveform.
6) Calculate the difference A (dB) between output levels “b” (dBs) and “a” (dBs) to check that it satisfies the specified value.
   A (dB) = b (dBs) – a (dBs)
7) For the CH-2, make a checking in the same manner.

5. E-E AUTO Check

Mode	E-E
Signal	Audio: 1 kHz, –4 dBs signal AUDIO IN terminal (CH-1, 2)
Measurement Point	AUDIO OUT terminal (CH-1, 2)
Measuring instrument	Audio level meter
Specified Value	–8 to –4 dBs

Note: 0 dBs = 0.775 Vrms

Switch setting

1) AUDIO MODE (AUDIO SET menu) FS32K
2) AUDIO AGC (AUDIO SET menu) .... ON

Checking method:

1) Enter 1 kHz, –4 dBs signal to the AUDIO IN terminal (CH-1, 2).
2) Check that the output of AUDIO OUT terminal (CH-1, 2) satisfies the specified value.

6. E-E AUTO Maximum Input Check

Mode	E-E
Signal	Audio: 1 kHz, +16 dBs signal (NTSC) 1 kHz, +14 dBs signal (PAL) AUDIO IN terminal (CH-1, 2)
Measurement Point	AUDIO OUT terminal (CH-1, 2)
Measuring instrument	Oscilloscope
Specified Value	No clip is found in the output waveform.

Note: 0 dBs = 0.775 Vrms

Switch setting

1) AUDIO MODE (AUDIO SET menu) FS32K
2) AUDIO AGC (AUDIO SET menu) .... ON

Checking method:

1) Enter 1 kHz, +16 dBs (NTSC) or +14 dBs (PAL) signal to the AUDIO IN terminal (CH-1).
2) Measure the output of AUDIO OUT terminal (CH-1), and check that no clip is found in the output waveform
3) For the CH-2, make a checking in the same manner.

6-3. SERVICE MODE

3-1. ADJUSTMENT REMOTE COMMANDER (RM-95)

The adjustment remote commander (RM-95) is used for changing the calculation coefficient in signal processing, EVR data, etc. The adjustment remote commander (RM-95) performs bi-directional communication with the unit using the remote commander signal line (LANC). The resultant data of this bi-directional communication is written in the non-volatile memory.

1. Using the Adjustment Remote Commander (RM-95)

1) Connect the adjustment remote commander to the LANC terminal.
2) Set the HOLD switch of the adjustment remote commander (RM-95) to "HOLD" (SERVICE position). If it has been properly connected, the LCD on the adjustment remote commander (RM-95) will display as shown in Fig. 6-3-1.



Fig. 6-3-1

3) Operate the adjustment remote commander (RM-95) as follows.
   - Changing the page
     The page increases when the EDIT SEARCH+ button is pressed, and decreases when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD Display	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

   - Changing the address
     The address increases when the FF (▶▶) button is pressed, and decreases when the REW (◀◀) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data increases when the PLAY (▶) button is pressed, and decreases when the STOP (■) button is pressed. There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     The PAUSE button must be pressed to write the adjustment data in the nonvolatile memory. (The new adjusting data will not be recorded in the nonvolatile memory if this step is not performed)
4) After completing all adjustments, turn off the main power supply once.

2. Precautions Upon Using the Adjustment Remote Commander (RM-95)

Mishandling of the adjustment remote commander may erase the correct adjustment data at times. To prevent this, it is recommended that all adjustment data be noted down before beginning adjustments and new adjustment data after each adjustment.

3-2. ADJUSTMENT REMOTE COMMANDER (NEW LANC JIG)

The adjustment remote commander (New LANC Jig) is used for changing the calculation coefficient in signal processing, EVR data, etc. The adjustment remote commander (New LANC Jig) performs bi-directional communication with the unit using the remote commander signal line (LANC). The resultant data of this bi-directional communication is written in the non-volatile memory.

1. Using the Adjustment Remote Commander (New LANC Jig))

1) Connect the adjustment remote commander (New LANC Jig) to the LANC terminal via the LANC cable (J-6082-442-A).
2) Set the slide switch of the adjustment remote commander (New LANC Jig) to "SERVICE" (SERVICE position). If it has been properly connected, the LCD on the adjustment remote commander (New LANC Jig) will display as shown in Fig. 6-3-2.

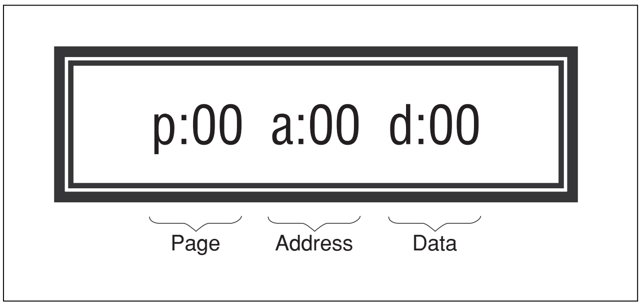


Fig. 6-3-2

3) Operate the adjustment remote commander (New LANC Jig) as follows.
   - Changing the page
     The page increases when the Page+ (▶▶) button is pressed, and decreases when the Page– (◀◀) button is pressed.
   - Changing the address
     The address increases when the ADD+ (▶) button is pressed, and decreases when the ADD– (❚❚) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data increases when the Data+ button is pressed, and decreases when the Data– button is pressed. There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     The Write (■) button must be pressed to write the adjustment data in the nonvolatile memory. (The new adjusting data will not be recorded in the nonvolatile memory if this step is not performed)
4) After completing all adjustments, turn off the main power supply once.

2. Precautions Upon Using the Adjustment Remote Commander (New LANC Jig)

Mishandling of the adjustment remote commander (New LANC Jig) may erase the correct adjustment data at times. To prevent this, it is recommended that all adjustment data be noted down before beginning adjustments and new adjustment data after each adjustment.

3-3. DATA PROCESS

The calculation of the DDS display and the adjustment remote commander display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Indicates the hexadecimal-decimal conversion table.

Hexadecimal-decimal Conversion Table

Upper digit of hexadecimal ① \ Lower digit of hexadecimal ②	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	77	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
B (b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: The characters shown in the parenthesis ( ) shown the display on the adjustment remote commander.

(Example) If the DDS display or the adjustment remote commander shows BD (bd);
Because the upper digit of the adjustment number is B (b), and the lower digit is D (d), the meeting point "189" of ① and ② in the above table is the corresponding decimal number.

Table 6-3-1

3-4. SERVICE MODE

1. Emergence Memory Address (Mechanism section)

Page C	Address F4 to FF

Address	Contents
F4	EMG code when first error occurs
F6	Upper: MSW code when shift starts when first error occurs Lower: MSW code when first error occurs
F7	Lower: MSW code to be moved when first error occurs
F8	EMG code when second error occurs
FA	Upper: MSW code when shift starts when second error occurs Lower: MSW code when second error occurs
FB	Lower: MSW code to be moved when second error occurs
FC	EMG code when last error occurs
FE	Upper: MSW code when shift starts when last error occurs Lower: MSW code when last error occurs
FF	Lower: MSW code to be moved when last error occurs

When no error occurs in this unit, data "00" is written in the above addresses (F4 to FF). when first error occurs in the unit, the data corresponding to the error is written in the first emergency address (F4 to F7). In the same way, when the second error occurs, the data corresponding to the error is written in the second emergency address (F8 to FB).
Finally, when the last error occurs, the data corresponding to the error is written in the last emergency address (FC to FF).

Note: After completing adjustments, be sure to initialize the data of addresses F4 to FF to "00".

Initializing method:

Order	Page	Address	Data	Procedure
1	0	01	01	
2	3	01	37	Press PAUSE (Write) button.
3	3	02		Check the data changes to "00".
4	0	01	00	

2. EMG Code (Emergency Code)

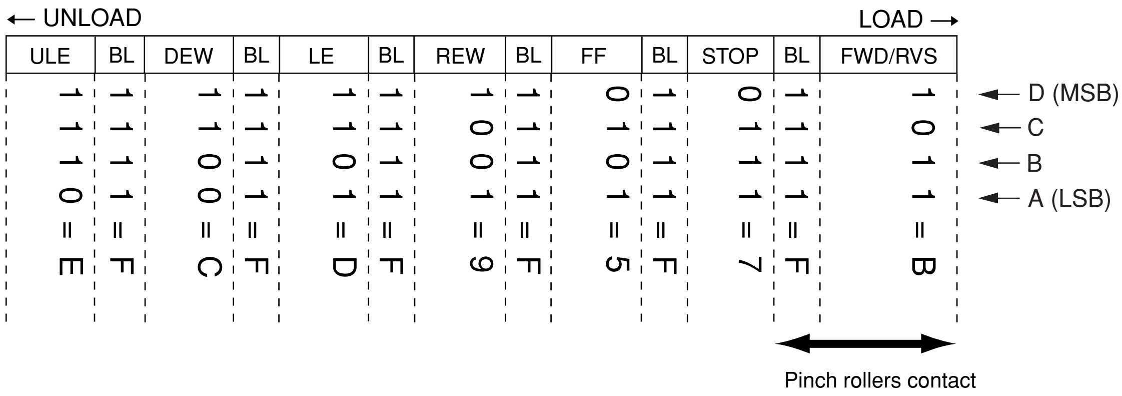
Codes corresponding to the errors which occur are written in C page, addresses F4, F8 and FC . The type of error indicated by the code are shown in the following table.

Code	Error Type
00	No error (Initial state)
10	Loading motor time-out during LOAD
11	Loading motor time-out during UNLOAD
20	Error during tape take up
22	T reel error
23	S reel error
25	Reel motor error
30	Error during normal capstan rotation
40	FG error during drum start-up
42	FG error during normal drum rotation
50	DEW detection
52	Wet DEW detection
70	Cassette compartment LOAD error
71	Cassette compartment UNLOAD error
72	Retry error because something is caught

3. MSW Code

MSW when an alarm occurred: MSW (Mode Switch) information when an alarm occurred.
MSW when a transition starts: MSW information when the mechanism position starts to move (if L motor runs).
MSW of target destination: MSW information of target position if the mechanism position moves.

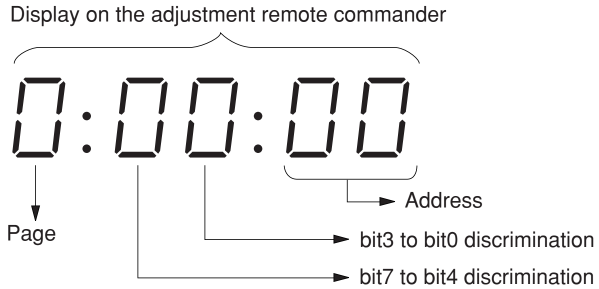
Mechanism position



Mechanism position	MSW code	Description
ULE	E	Unload end position. The mechanism stops at this position when it ejects a cassette. It waits for cassette insertion. The guide starts to expand as it advances to the load position.
BL	F	Blank code. It is provided between code and code. The mechanism does not stop at this code (excluding Load/Unload).
DEW	C	Code during loading.
LE	D	Load end position of tape guide.
REW	9	Position of REW operation. The pinch rollers are released.
FF	5	Position of FF operation. The pinch rollers are released.
STOP	7	Stop position. The pinch rollers are released, the tension regulator returns, and the brake is applied to both reels.
FWD/RVS	B	PB, REC, CUE, REVIEW, and PAUSE positions. The mechanism operates at this position in the mode where normal screen appears with the pinch rollers in contact state and the tension regulator turned on.
NULL	0	Code not existing in MD. Default value.

4. Bit Value Discrimination

Bit values must be discriminated using the display data of the adjustment remote commander for the following items. Us the table below to discriminate if the bit value is “1” or “0”.



(Example) If the remote commander display is “8E”, bit value from bit 7 to bit 4 can be discriminated from the column Ⓐ, and those from bit 3 to bit 0 from column Ⓑ.

Display on the adjustment remote commander	Bit values			
	bit3 or bit7	bit2 or bit6	bit1 or bit5	bit0 or bit4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
Ⓐ 8	1	0	0	0
9	1	0	0	1
A (A)	1	0	1	0
B (b)	1	0	1	1
C (C)	1	1	0	0
D (d)	1	1	0	1
Ⓑ E (E)	1	1	1	0
F (F)	1	1	1	1

5. LED Check

Page 7	Address 00, 01, 02 and 04

Note: Check that the data of page: 0, address: 10 is “00”.

Checking method:

Order	Page	Address	Data	Procedure
1	7	01	90	
2	7	02	FF	
3	7	04	01	
4	7	00	01	Press PAUSE (Write) button.
5	7	02		Check the data changes to “01”.
6				Check that all LEDs light up in the following colors respectively.

LED	Color
PLAY, ON/STANDBY	Green
REC, CAUTION	Red
CASSETTE, HDV, DVCAM, 60, 50, DV i.LINK, HDV i.LINK, DVCAM i.LINK, REW, FF, PAUSE	Orange

Processing after Completing Adjustment:

Order	Page	Address	Data	Procedure
1	7	01	90	
2	7	02	FF	
3	7	04	00	
4	7	00	01	Press PAUSE (Write) button.
5	7	02		Check the data changes to “01”.
6	7	01	00	
7	7	02	00	

6. Switch Check

Page 7	Address 65 to 6A

Note: Check that the data of page: 0, address: 10 is “00”.

Using method:

1) Select page: 7, address: 65 to 6A.
2) By discriminating the display data, the pressed key can be discriminated.

Address	Data							
	00	1B	36	53	77	A0	CF	FF
	00 to 0C	0D to 27	32 to 3A	4F to 58	73 to 7B	8B to B7	B8 to E6	E7 to FF
65 (KEY AD0) (IC4003 ⑬⑨)	STOP (FR-255 board) (S113)	FF (FR-255 board) (S109)	REC (FR-255 board) (S106)	—	—	—	—	No key input
66 (KEY AD1) (IC4003 ⑭⓪)	PAUSE (FR-255 board) (S114)	REW (FR-255 board) (S110)	—	—	—	—	—	No key input
67 (KEY AD02) (IC4003 ⑭①)	PLAY (FR-255 board) (S115)	EXEC (FR-255 board) (S111)	UP (FR-255 board) (S107)	DOWN (FR-255 board) (S105)	RIGHT (FR-255 board) (S104)	LEFT (FR-255 board) (S103)	—	No key input
68 (KEY AD3) (IC4003 ⑭②)	MENU (FR-255 board) (S117)	—	—	—	—	—	—	No key input
69 (KEY AD4) (IC4003 ⑭③)	—	—	—	—	—	DISPLAY OUTPUT OFF (FR-255 board) (S102)	DISPLAY OUTPUT ALL (FR-255 board) (S102)	DISPLAY OUTPUT S VIDEO/VIDEO (FR-255 board) (S102)
6A (KEY AD5) (IC4003 ⑭④)	—	—	—	—	—	INPUT SELECT HDV/DV (FR-255 board) (S101)	INPUT SELECT VIDEO (FR-255 board) (S101)	INPUT SELECT S VIDEO (FR-255 board) (S101)

7. Record of Use Check

Page 7	Address 90 to 95, A4 to AF, C8 to CD

Note 1: This data will not be erased (reset) when the lithium 3 V power supply (VD-036 board BT1001) is removed.
Note 2: When the drum was replaced, initialize the drum rotation counted time.
Note 3: Check that the data of page: 0, address: 10 is “00”.

Address	Function		Remarks
90	Eject count with tape	Count (H)	100000th place digit and 10000th place digit of Eject count (decimal digit)
91		Count (M)	1000th place digit and 100th place digit of Eject count (decimal digit)
92	(BCD code)	Count (L)	10th place digit and 1st place digit of Eject count (decimal digit)
93	Eject count without	Count (H)	100000th place digit and 10000th place digit of Eject count (decimal digit)
94	tape	Count (M)	1000th place digit and 100th place digit of Eject count (decimal digit)
95	(BCD code)	Count (L)	10th place digit and 1st place digit of Eject count (decimal digit)
A4	Power supplying	Hour (H)	100000th place digit and 10000th place digit of counted time (decimal digit)
A5	time	Hour (M)	1000th place digit and 100th place digit of counted time (decimal digit)
A6		Hour (L)	10th place digit and 1st place digit of counted time (decimal digit)
A7	(BCD code)	Minute	
A8	Drum rotation	Hour (H)	100000th place digit and 10000th place digit of counted time (decimal digit)
A9	counted time	Hour (M)	1000th place digit and 100th place digit of counted time (decimal digit)
AA		Hour (L)	10th place digit and 1st place digit of counted time (decimal digit)
AB	(BCD code)	Minute	
AC	Tape run time	Hour (H)	100000th place digit and 10000th place digit of counted time (decimal digit)
AD		Hour (M)	1000th place digit and 100th place digit of counted time (decimal digit)
AE		Hour (L)	10th place digit and 1st place digit of counted time (decimal digit)
AF	(BCD code)	Minute	
C8	User initial power	Year	
C9	on date	Month	After setting the clock, set the date of power on next
CA	(BCD code)	Day	
CB	Final condensation	Year	
CC	occurrence date	Month	
CD	(BCD code)	Day	

Using method:
1) The record of use data is displayed at page: 7, addresses: 90 to 95, A4 to AF, C8 to CD.

Initializing method:

Order	Page	Address	Data	Procedure
1	7	01	7F	
2	7	02	FF	
3	7	00	01	Press PAUSE (Write) button.
4	7	02		Check the data changes to “01”.
5	7	01	00	
6	7	02	00	

8. Record of Self-diagnosis Check

Page 7	Address B0 to C6

Note 1: This data will not be erased (reset) when the lithium 3 V power supply (VD-036 board BT1001) is removed.
Note 2: Check that the data of page: 0, address 10 is "00".

Address	Self-diagnosis code
B0	"Repaired by" code (Occurred 1st time) *1
B1	"Block function" code (Occurred 1st time)
B2	"Detailed" code (Occurred 1st time)
B4	"Repaired by" code (Occurred 2nd time) *1
B5	"Block function" code (Occurred 2nd time)
B6	"Detailed" code (Occurred 2nd time)
B8	"Repaired by" code (Occurred 3rd time) *1
B9	"Block function" code (Occurred 3rd time)
BA	"Detailed" code (Occurred 3rd time)
BC	"Repaired by" code (Occurred 4th time) *1
BD	"Block function" code (Occurred 4th time)
BE	"Detailed" code (Occurred 4th time)
C0	"Repaired by" code (Occurred 5th time) *1
C1	"Block function" code (Occurred 5th time)
C2	"Detailed" code (Occurred 5th time)
C4	"Repaired by" code (Occurred the last time) *1
C5	"Block function" code (Occurred the last time)
C6	"Detailed" code (Occurred the last time)

*1 : "01" → "C", "03" → "E"

Using method:

1) The past self-diagnosis codes are displayed at page: 7, address: BC to C6. Refer to "1-1. SELF-DIAGNOSIS FUNCTION" for detail of the self-diagnosis code.

Initializing method:

Order	Page	Address	Data	Procedure
1	7	01	C0	
2	7	00	01	Press PAUSE button.
3	7	B0 to C6		Check that the data is "00".
4	7	00	00	
5	7	01	00	

HVR-M15J/M15U/M15N/M15E/M15P/M15C
RMT-DS5

SONY®

SERVICE MANUAL

Ver 1.1 2006.08

US Model
Canadian Model
AEP Model
E Model
Chinese Model
Japanese Model

SUPPLEMENT-1

File this supplement with the service manual.
(DI06-047)

- **Change of Repair Parts**

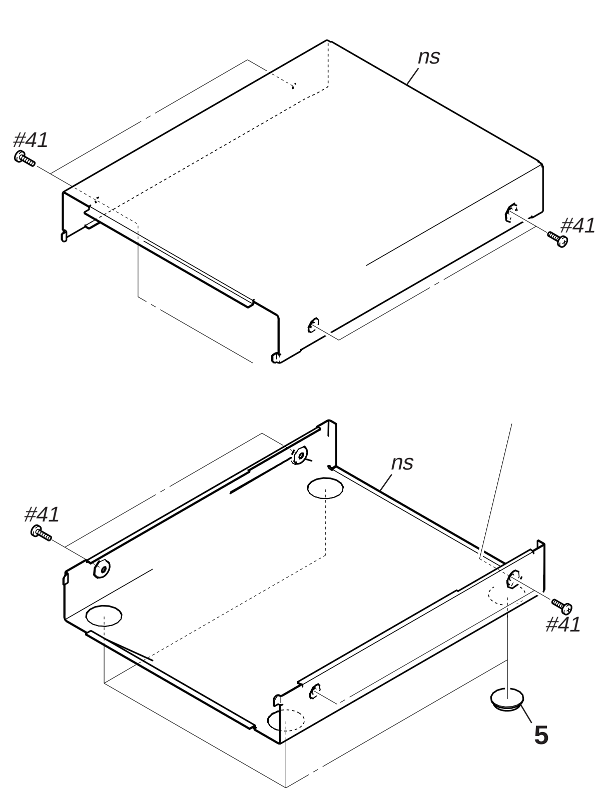
Sony EMCS Co.
2006H0500-1

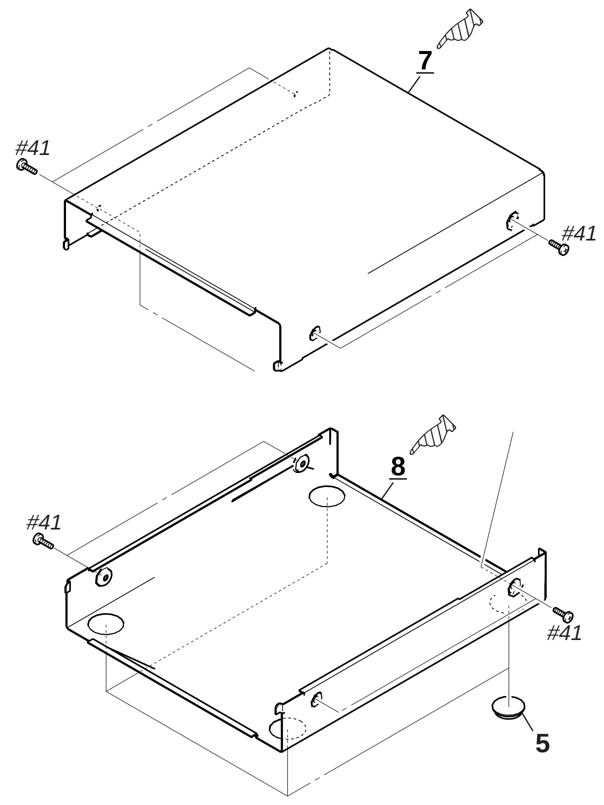
Published by Kohda TEC

5. REPAIR PARTS LIST

: Points added portion.
: Points changed portion.

5-1. EXPLODED VIEWS

<table>
<tr><th>Page</th><th>Former</th><th>New</th></tr>
<tr><td>5-2</td><td>

Ref. No. | Part No. | Description
—— | ———— | ————————
—— | ———— | ————————</td><td>

Ref. No. | Part No. | Description
7 | 3-065-749-21 | CASE, UPPER
8 | 3-065-749-31 | CASE, UPPER</td></tr>
</table>

SONY®

2-678-753-**11**(1)

Digital HD Videocassette Recorder

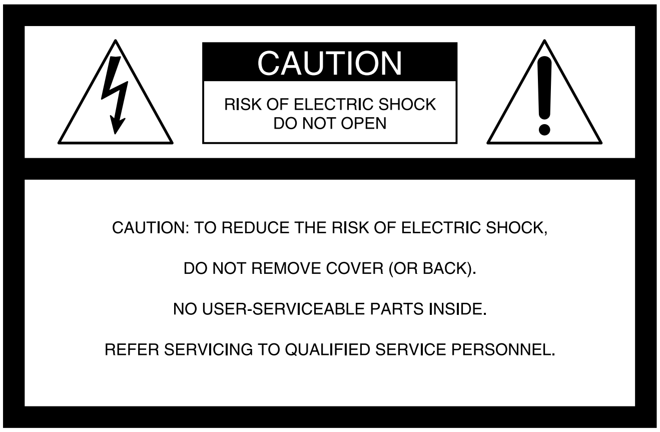
Operating Instructions

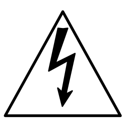
HDV 1080i DVCAM™ DV Digital Video Cassette Mini DV Digital Video Cassette

HVR-M15U/M15N/M15E/M15P

WARNING

To reduce fire or shock hazard, do not expose the unit to rain or moisture.





This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Owner's record

The model number and the serial number are located at the name plate on the left of the unit. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. HVR-　　Serial No. ______________________
Model No. AC-L15A　　Serial No. ______________________

For customers in the U.S.A.

HVR-M15U only

If you have any questions about this product, you may call: Sony's Business Information Center (BIC) at 1-800-686-SONY (7669)

or Write to: Sony Customer Information Services Center 6900-29 Daniels Parkway, PMB 330 Fort Myers, Florida 33912

Declaration of Conformity

Trade Name:	SONY
Model:	HVR-M15U
Responsible Party:	Sony Electronics Inc.
Address:	16530 Via Esprillo, San Diego, CA 92127 U.S.A.
Telephone Number:	858-942-2230

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

NOTE:

This equipment has been tested and found to comply with the limits for Class B digital device, pursuant to Part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.
– Increase the separation between the equipment and receiver.
– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
– Consult the dealer or an experienced radio/TV technician for help.

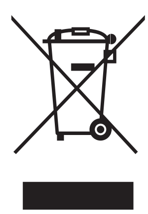
NOTICE FOR CUSTOMERS IN THE UNITED KINGDOM

HVR-M15E only
A moulded plug complying with BS1363 is fitted to this equipment for your safety and convenience.

Should the fuse in the plug supplied need to be replaced, a fuse of the same rating as the supplied one and approved by ASTA or BSI to BS1362 (i.e., marked with ASTA or BSI mark) must be used.

If the plug supplied with this equipment has a detachable fuse cover, be sure to attach the fuse cover after you change the fuse. Never use the plug without the fuse cover. If you should lose the fuse cover, please contact your nearest Sony service station.

Disposal of Waste Electrical and Electronic Equipment for business use (Applicable in the European Union and other European countries with separate collection systems)



This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable take-back scheme for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local Sony office or visit Sony Europe's web site for business customers:
http://www.sonybiz.net/environment

For the customers in Europe

HVR-M15E only
This product with the CE marking complies with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.
Compliance with these directives implies conformity to the following European standards:
- EN60065 :Product Safety (Supplied AC Adapter only)
- EN55103-1 :Electromagnetic Interference (Emission)
- EN55103-2 :Electromagnetic Susceptibility (Immunity)

This product is intended for use in the following Electromagnetic Environment(s):
E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors) and E4 (controlled EMC environment ex. TV studio).

ATTENTION
The electromagnetic fields at the specific frequencies may influence the picture and sound of this unit.

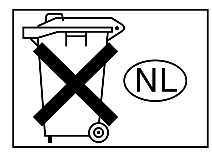
For the customers in the Nederland
Voor de klanten in Nederland

Dit apparaat bevat een vast ingebouwde batterij die niet vervanden hoeft te worden tijdens de levensduur van het apparaat.

Raadpleeg uw leverancier indien de batterij toch vervangen moet worden.
De batterij mag alleen vervangen worden door vakbekwaam servicepersoneel.

Gooi de batterij niet weg maar lever deze in als klein chemisch afval (KCA).

Lever het apparaat aan het einde van de levensduur in voor recycling, de batterij zal dan op correcte wijze verwerkt worden.



Caution

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws. Also, use of this recorder with cable television transmission may require authorization from the cable television transmission and/or program owner.

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Chapter 1

Overview

Features

The HVR-M15U/M15N/M15E/M15P is a digital HD videocassette recorder supporting HDV format and DVCAM/DV format. The unit produces stable, superior picture quality by digital processing and separating image signals into color difference signals and a luminance signal (component video). The unit provides i.LINK (HDV/DV) jack, COMPONENT OUT jacks, S VIDEO IN/OUT jacks, composite IN/OUT jacks, and AUDIO IN/OUT jacks. These jacks allow you to connect other equipment like non-linear editors. The main features of the unit are described below.

HDV format

The unit can perform HDV (High-Definition Digital Video) recording and playback on a DVCAM format video cassette or a DV format video cassette.
The compression system of HDV format is the MPEG2 system adopted in the high-definition broadcasting and the Blu-ray Disk System.
The unit adopts the 1080 scanning lines (interlace (HDV1080/60i and HDV1080/50i)/1440 × 1080 pixels) format of the HDV specifications. The recording bit rate is approximately 25 Mbps. The unit is equipped with an i.LINK digital interface and can be digitally connected with HDV-compatible televisions or computers.

DVCAM/DV format

DVCAM is based on the consumer DV format, which uses the 4:1:1 component digital format (60i) or the 4:2:0 format (50i), and provides a 1/4-inch digital recording format for professional use. The unit provides both DVCAM format recording/playback and DV format in SP mode recording/playback.
For details, see "Compatibility of HDV, DVCAM, and DV Formats" on page 68.

Compatible with both 1080/60i (NTSC) and 1080/50i (PAL) systems

The unit is compatible with 60i and 50i systems. You can switch these input signals using the menu setting *(page 55)*. This compatibility allows you to record (download) or play back (upload) both 50i and 60i signals with your VCR, computer, or other equipment. However, the unit cannot convert the color system of the signals.
The unit set in 60i system has a field frequency of 59.94 Hz.

High definition down convert function

When you want to playback a tape recorded in HDV format, you can down convert any images to output them. This function allows you to preview recorded-images on a monitor which is not compatible with High-Definition (HD) format. Also, you can select an aspect ratio from SQUEEZE, LETTER BOX (except i.LINK HDV/DV jack output), or EDGE CROP.

Multiple input/output interfaces

i.LINK HDV/DV jack, COMPONENT OUT jacks, S VIDEO jacks and VIDEO jacks and AUDIO jacks are equipped on the unit and enable the connection with various devices.

JOG AUDIO function

If you use the optional remote control unit DSRM-10 (not supplied), audio can be monitored at various playback speeds when in jog/shuttle mode.
(Jog audio cannot be output when the tape is recorded in HDV format.)

Screen Language Setting

You can select the language.
The default language setting is English.
See page 53 to change the screen language.

Compact size allowing vertical installation

The compact size of the unit allows installation in a vertical position and saves space. During non-linear editing, you can install the unit in a vertical position next to the computer and save working space.

Easy maintenance functions

- **Self-diagnostics/alarm functions:** The system automatically detects an invalid operation, bad connection or a malfunction, and outputs a description, a cause and a recovery method with COMPONENT OUT jacks, S VIDEO jack, and VIDEO jack.
- **Digital hours meter:** A digital hours meter counts four types of time data—operating time, drum rotation time, tape running time, and tape threading/unthreading. The digital hours data are indicated on the menu.

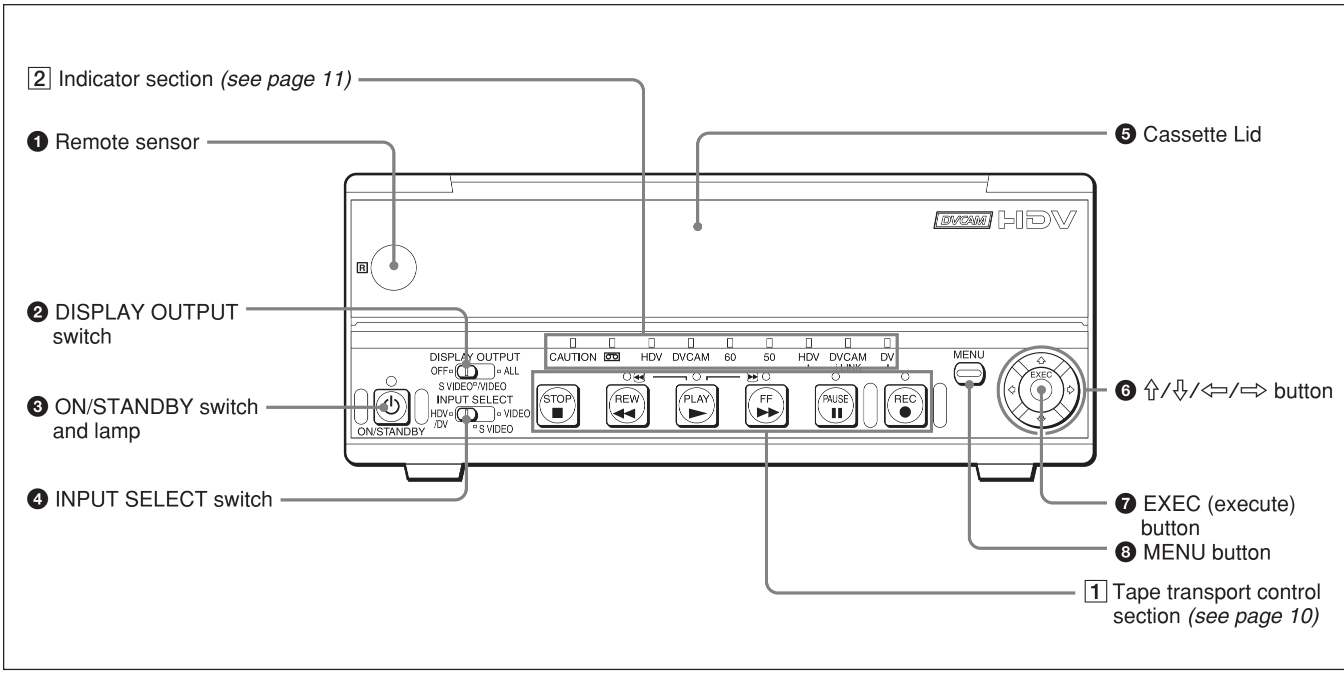
DVCAM™, DV, and MiniDV are trademarks of Sony Corporation.

HDV is a trademark of Sony Corporation and Victor Company of Japan Ltd.

All other product names mentioned here may be the trademarks or registered trademarks of their respective companies. "™" and "®" are not mentioned in each case in this manual.

Location and Function of Parts

Front Panel



❶ Remote sensor

❷ DISPLAY OUTPUT switch

Selects the destination for the text data to be superimposed via output jacks.

OFF : Does not superimpose text data to output.

S VIDEO/VIDEO : Superimposes text data to S VIDEO OUT jack and VIDEO OUT jack.

ALL : Superimposes text data to COMPONENT OUT jacks, S VIDEO OUT jack, and VIDEO OUT jack.

❸ ON/STANDBY switch and lamp

Press this switch to turn the unit on, and the ON/STANDBY lamp lights up in green. When you press this switch again, the unit goes into STANDBY mode and the lamp lights up in red.

❹ INPUT SELECT switch

Switches the signal input jack from HDV/DV jack, S VIDEO jack, and VIDEO jack.

HDV/DV : Inputs a signal from HDV/DV jack.

S VIDEO : Inputs a signal from S VIDEO jack.

VIDEO : Inputs a signal from VIDEO jack.

Notes

- Do not change the setting of this switch while recording in progress, or it causes noise added to images and sounds. Also, a part of the tape where the change of setting applied will not be recorded properly. Also, the time code may operate discontinuously.
- If you change the setting of this switch while recording in progress, the output signal from HDV/DV jack may be interrupted. Also, the unit may detect signals such as a copyright information signal incorrectly.
- When a signal is input from HDV/DV jack, the settings of the menu listed below are unavailable.
  – 60i/50i SEL
  – AUDIO MODE
  – AUDIO LOCK
  – AUDIO AGC
  – AUDIO REC LV

❺ Cassette Lid

Open this lid to insert or eject a cassette.

For details of usable cassettes, see "Notes on Power Supply and Video Cassettes" on page 20.

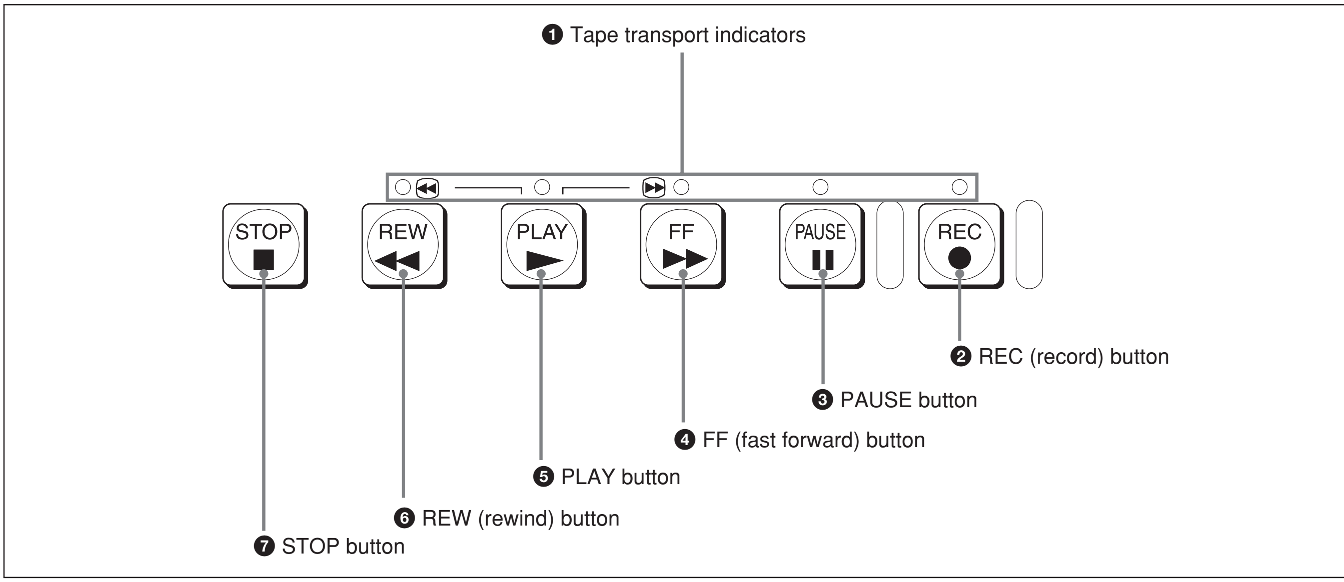
For details of inserting or ejecting a cassette, see "Inserting/Ejecting Cassettes" on page 21.

❻ ⇧/⇩/⇦/⇨ button
Use these buttons in menu settings and other settings.

❼ EXEC (execute) button
Use this button in menu settings.

❽ MENU button
Press this button to display the menu on screen.

1 Tape transport control section



❶ Tape transport indicators

❷ REC (record) button

When you press and hold this button then press PLAY button, the each indicator lights and recording starts. If you press this button while the tape is stopped, you can check EE picture and audio signals for a moment. When HDV/DV is selected, if [HDV/DV IN TC] in [TC/UB SET] menu is set to [EXTERNAL], you can also check EE time code signals. Press STOP button to end the check.

For details, see "EE/PB SEL" in "IN/OUT REC" menu on page 48.
For details of the time code, see "TC/UB SET" on page 52.

Notes

- The unit does not have an LP recording mode of the consumer DV format. Only recording in SP mode is available.
- To set the unit to recording pause mode with the remote control unit DSRM-10 (not supplied), press PAUSE button while holding down PLAY button to set the unit to the playback pause mode, then press REC button on the DSRM-10.
- When the recording mode is displayed in HDV, it may take a few seconds to start recording. During this time, REC indicator blinks.

❸ PAUSE button

Press this button to set the unit to pause mode while recording or playing. Press this button again to resume the operation.

❹ FF (fast forward) button

When you press this button, the indicator lights and the tape is fast forwarded. During fast forward, the picture does not appear on the monitor (you can see the picture as it is seen in EE mode[1] during fast forward). To locate a scene while monitoring the picture, keep pressing this button during fast forward, playback or in playback pause mode (picture search).

Notes

- If you set [EE/PB SEL] in [IN/OUT REC] menu to [PB], EE picture and EE audio signals are not output.
- If you set [FF/REW SPEED] in [VTR SET] menu to [SHUTTLEMAX], the picture is played back during fast forward.

  For details on running speed with [SHUTTLEMAX], see "FF/REW SPEED" in "VTR SET" menu on page 51.

---

1) "EE" stands for "Electric to Electric." In EE mode, the video and audio signals input to the VCR's recording circuitry do not pass through any magnetic conversion circuits but output via electric circuits only. This mode is used to check the input signals and adjust input levels. The pictures output in EE mode are referred to as EE pictures.

❺ PLAY button
When you press this button, the indicator lights and playback begins.
If you press this button while holding down REW button during stop, the tape is rewound to its beginning and starts playing automatically (during rewind, REW indicator lights and PLAY indicator blinks).

Notes

- When the unit is playing back a part of the tape where the recording format has been changed within HDV format, DVCAM format, or DV format, or between 60i format and 50i format, the picture and sound may be distorted.
- The unit does not have an LP recording mode of the consumer DV format.

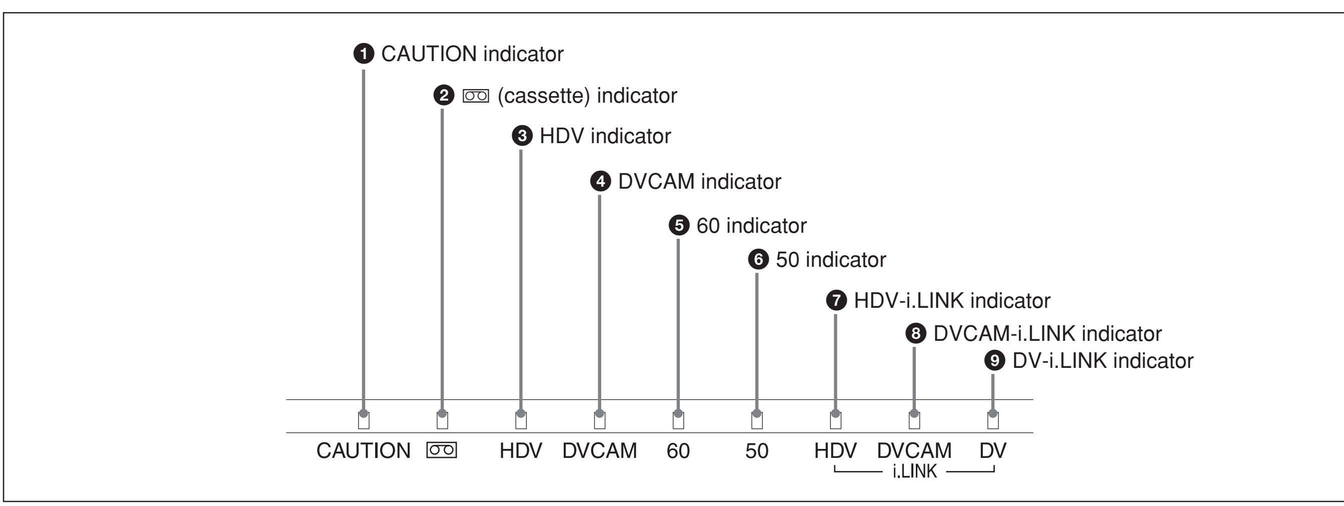
❻ REW (rewind) button
When you press this button, the indicator lights and the tape starts rewinding.
During rewind, the image on the monitor is not displayed (you can see the picture as it is seen in EE mode during rewind). To locate a scene while monitoring the picture, hold this button down during rewind, playback or in the playback pause mode.
If you press PLAY button while holding down this button during stop, the tape is rewound to its beginning and starts playing automatically (during rewind, REW indicator lights and PLAY indicator blinks).

Notes

- If you set [EE/PB SEL] in [IN/OUT REC] menu to [PB], EE picture and EE audio signals will not be output.
- If you set [FF/REW SPEED] in [VTR SET] menu to [SHUTTLEMAX], the picture is played back during rewind.
  For details on running speed with [SHUTTLEMAX], see "FF/REW SPEED" in "VTR SET" menu on page 51.

❼ STOP button
Press this button to stop the tape transport operation completely.

2 Indicator section



❶ CAUTION indicator
Blinks when an error occurs.
For details on cautions, see "Self-diagnosis display/ Warning Indicators" on page 62.

❷ (cassette) indicator
Lights when a digital video cassette is loaded.
This indicator lights during standby, when the cassette is inserted to the unit. While the cassette is being ejected, the indicator blinks.
For details of inserting or ejecting a cassette, see "Inserting/Ejecting Cassettes" on page 21.

(Continued)

❸ HDV indicator
Lights when the unit is in the following operating status.
- When a tape recorded in HDV format is being played back.
- When HDV signals are input through the i.LINK interface.
- When [HDV/DV SEL] in [IN/OUT REC] menu is set to [HDV].*

  * Even when [HDV/DV SEL] is set to [AUTO] with no signal input, while the last signal input was HDV format or the last tape played was in HDV format, this indicator lights.

❹ DVCAM indicator
Lights when the unit is in the following operating status.
- When a tape recorded in DVCAM format is being played back.
- When [HDV/DV SEL] in [IN/OUT REC] menu is set to [DV] and [📼 REC MODE] in [IN/OUT REC] menu is set to [DVCAM] (during recording or in EE mode).*

  * Neither HDV indicator nor DVCAM indicator lights during recording in DV (SP) format or a playback of a tape recorded in DV (SP) format.

❺ 60 indicator
Lights when the unit is in the following operating status.
- During recording or in EE mode when [60i/50i SEL] in [OTHERS] menu is set to [60i].
- During HDV1080/60i or NTSC signals are input from i HDV/DV jack.
- A tape that has HDV1080/60i or NTSC signals are being played back.

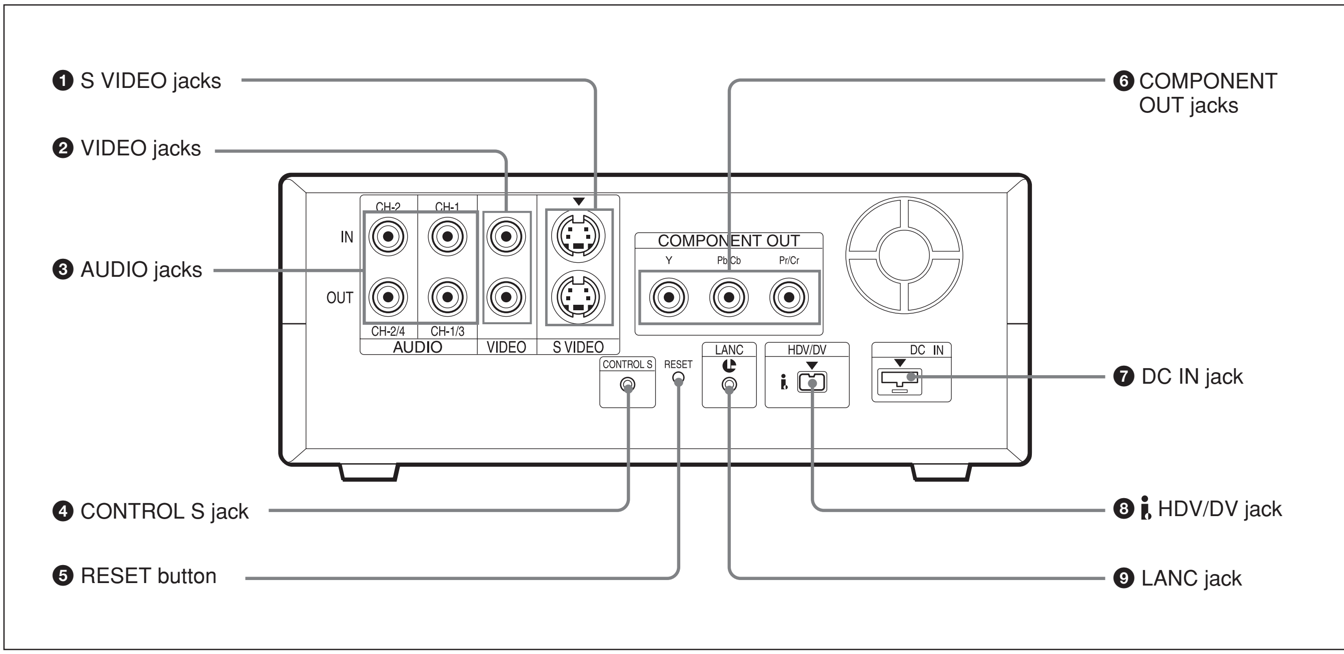
❻ 50 indicator
Lights when the unit is in the following operating status.
- During recording or in EE mode when [60i/50i SEL] in [OTHERS] menu is set to [50i].
- During HDV1080/50i, or PAL signals are input from i HDV/DV jack.
- A tape that has HDV1080/50i or PAL signals are being played back.

❼ HDV-i.LINK indicator
Lights when HDV signals are input/output through the i.LINK interface.

❽ DVCAM-i.LINK indicator
Lights when DVCAM signals are input/output through the i.LINK interface.

❾ DV-i.LINK indicator
Lights when DV signals are input/output through the i.LINK interface.

Rear Panel



❶ S VIDEO jacks
To connect a device equipped with an S VIDEO jack, use S VIDEO jacks on the unit.
If you use S VIDEO jacks, you can input/output high-quality video with less signals deterioration in quality than the one connected to the standard VIDEO jack.
When DISPLAY OUTPUT switch is set to S VIDEO/VIDEO or ALL, text data such as the time code, menus, and alarm messages are superimposed on an external monitor connected to S VIDEO jack *(page 18)*.

❷ VIDEO jacks
Use to input and output analog video signals.
Text data is superimposed on a monitor in the same way as S VIDEO jack connection *(page 18)*.

❸ AUDIO jacks
Use to input and output analog audio signals.
When [AUDIO MODE] in [AUDIO SET] menu is set to [FS32K], audio source will be recorded on channels 1 and 2.

Notes

- When [AUDIO MIX] in [AUDIO SET] menu is set to [MIX], the audio output level becomes 50% (–6 dB) of the original audio level on each channel.
- If you input a sound whose level exceeds the acceptable range, the sound recorded will be distorted.
  For details on the available volume levels, see the "Specifications" of the unit (page 74).

❹ CONTROL S jack
Connect to a remote control unit DSRM-10 (not supplied) for controlling the unit.
You can also use the DSRM-20 (no longer manufactured: not supplied).

Note

When you use a CONTROL S device, set [COMMANDER] in [OTHERS] menu to [CONTROL S].

❺ RESET button
If you press this button with the tip of a ballpoint pen or similar tool, the following settings are initialized.
– [CLOCK SET] *(page 54)* and [60i/50i SEL] *(page 55)* in [OTHERS] menu.
– The setting on the unit except the menu settings.

(Continued)

❻ COMPONENT OUT jacks
Use to output component signals.
To connect a device equipped with the component video input connectors, use COMPONENT OUT jacks on the unit. If you use COMPONENT OUT jacks, you can output high-quality video with even less signal deterioration in quality compared with S VIDEO jack. You can set the output video format by using [COMPONENT] of [VIDEO OUT] in [IN/OUT REC] menu.
When DISPLAY OUTPUT switch is set to ALL, text data such as time code, menu, and alarm messages are superimposed on a monitor connected using COMPONENT OUT jacks *(page 18)*.

Notes

- When you change the video format setting of [COMPONENT] of [VIDEO OUT] in [IN/OUT REC] menu, the images output from i HDV/DV jack, S VIDEO jack, and VIDEO jack may be distorted for a moment.
- The output level of COMPONENT OUT jacks is as follows:
  Output at 480i NTSC
  With [BETACAM] selected in [IN/OUT REC] menu
    Y: 1.0 Vp-p
    (with 0.286 Vp-p sync negative,
    output impedance 75 Ω (ohms), unbalanced)
    Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p
    (output impedance 75 Ω (ohms), unbalanced)
    (75% color bars with 7.5 IRE setup)
  With [SMPTE] selected in [IN/OUT REC] menu
    Y: 1.0 Vp-p
    (with 0.3 Vp-p sync negative,
    output impedance 75 Ω (ohms), unbalanced)
    Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p
    (output impedance 75 Ω (ohms), unbalanced)
    (100% color bars with no setup)
  Output with other settings
    Y: 1.0 Vp-p
    (output impedance 75 Ω (ohms), unbalanced)
    Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p
    (output impedance 75 Ω (ohms), unbalanced)
    (100% color bars with no setup)
    480i/480p:
    Y: with 0.3 Vp-p sync negative
    1080i:
    Y/Pb/Pr: with 0.6 Vp-p 3-level sync
- When you play back HDV-formatted tape with copyright protected signals or input i.LINK signals with copyright protection to i HDV/DV jack, pictures may be output in either 480i (NTSC) or 576i (PAL) format regardless of the setting of [COMPONENT] of [VIDEO OUT] in [IN/OUT REC] menu.
- When you play back a tape in DVCAM/DV, and while an EE picture in NTSC/PAL is displayed, the 480i resolution or the 576i resolution is output, regardless of the setting of [COMPONENT] of [VIDEO OUT] in [IN/OUT REC] menu.

❼ DC IN jack
Connect to the AC outlet using the supplied AC adaptor.

❽ i HDV/DV jack (4-pin)
Use this jack to input/output the digital signals that complies with the i.LINK standard. Use when a device connected to the unit has an i.LINK jack. If you connect the unit and another device using i HDV/DV jack, you can minimize deterioration of picture quality during recording, dubbing, or capturing still pictures, all by means of digital signal processing.
For details, refer to the instruction manual of the external device.

Notes

- When you connect with the i.LINK cable to a computer and the unit, check the direction of the jack. If you forcibly insert the jack, the terminal may be damaged or cause the unit to malfunction. Allign ▲ mark of the i.LINK cable with ▼ mark on the unit and insert the i.LINK cable.
- This jack is only compatible with HDV1080i/ DVCAM/DV signals.
  For details, see “About i.LINK” on page 73.
- If video signals have been input to i HDV/DV jack and you output these video signals to S VIDEO or VIDEO connectors, the sync and burst of the corresponding EE picture is not synchronized.
- If the unit is connected to a device equipped with a 6-pin i.LINK jack, when you intend to disconnect or reconnect the i.LINK cable, turn off the device and pull out the plug of its power cord from the AC outlet beforehand. If you connect or disconnect i.LINK cable while the device is connected to the AC outlet, high-voltage current (8 to 40 V) is output from the i.LINK jack of the device to the unit, which may cause a malfunction.

- When connecting a device that has a 6-pin i.LINK jack to the unit, first, connect the plug of the cable to the 6-pin i.LINK jack.
- The video signal which is input from i HDV/DV jack will output directly to COMPONENT OUT jacks, S VIDEO jack, and VIDEO jack with the jitter of i.LINK signal. This jitter may be displayed on a monitor continuously. Be careful with this jitter when you connect the unit to other recording devices for recordings. This jitter will not affect on a recording with the unit.
- When you change the video format setting of [DOWN CONVERT] of [i.LINK SET] in [IN/OUT REC] menu, the video signal output from COMPONENT OUT jacks, S VIDEO OUT jack, or VIDEO OUT jack might be distorted for a moment.

❾ LANC jack

Use this jack when controlling the tape transport operation of the unit using a device that has a LANC[1)] jack.

Notes

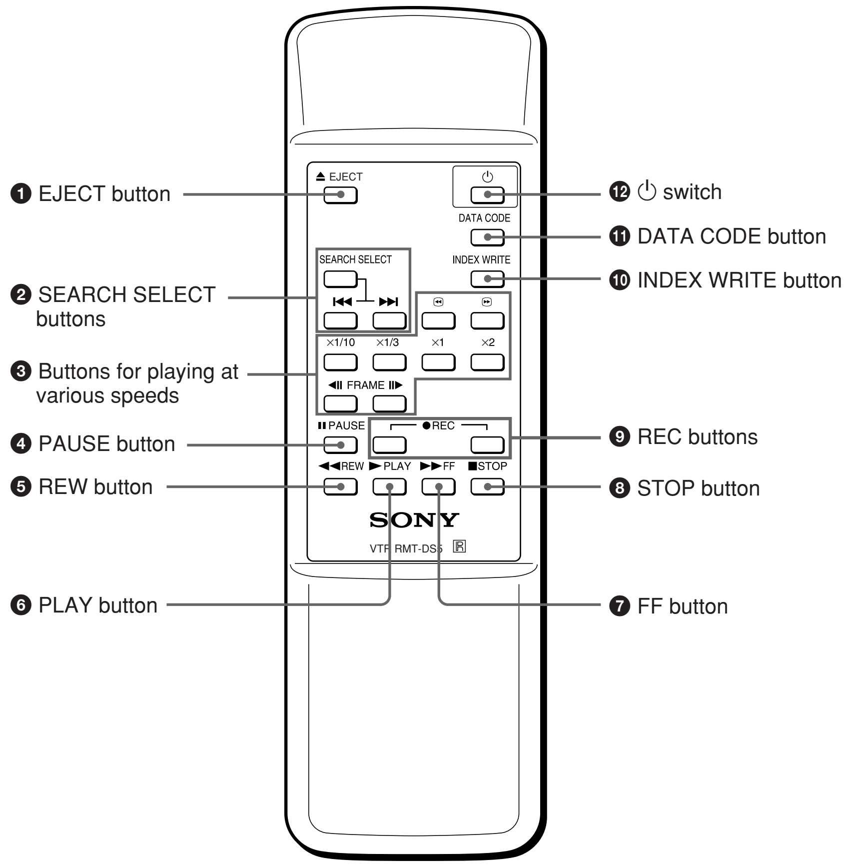
- LANC jack on the unit has only LANC-S functions. The unit has no LANC-M functions. A device that is set to LANC-S mode cannot be connected to the unit. Either this, the unit or the other device may not operate properly.
- When using the unit as a player, set LANC mode on the recorder to M. A device that does not have an M/S switching function cannot be used to control the unit.
- When the device for connecting to the unit has [LANC-M] function to switch between SHUTTLE A/B, select SHUTTLE A for HDV-formatted tape, and SHUTTLE B for the DVCAM/DV-formatted tape.
- LANC connection transmits command signals for playback, stop, pause playback, as well as the time code, tape counter, and data status of the unit.
- Jacks labeled CONTROL L have the same function as LANC jacks.
- There are some limitations when you edit an HDV-formatted tape.
  Refer to the "Notes" in "Preparations" on page 42.

Notes on all Video output jacks

- The unit is only compatible with standard video signals. If you input the types of video signals shown below, recorded picture and sound may be distorted.
  – Signals from some home game machines
  – Blue background screen or gray background screen from a consumer VCR
  – Pictures played at a speed other than normal by a VCR that does not have the TBC (Time Base Corrector)
  – Video signals in which the sync signals are distorted
  – Signals from a defective cassette (tape or recording condition is bad) played by an analog VCR that does not have TBC
- To absorb the jitter of input video signals, the distortion of video signals are processed in the underscan portion. You may see this procedure on an underscan monitor, yet this is not a malfunction. Also, the picture recorded on the tape will not be affected.
- To output video signals to VIDEO, S VIDEO, or COMPONENT OUT jacks without text data, set DISPLAY OUTPUT switch to OFF.
- During recording or in EE mode, the subcarrier of the color signal to be output from the unit is not synchronized with the horizontal sync signal. The color of the picture or the horizontal sync signal may be distorted depending on the type of monitor connected to the unit.

1) LANC (Local Application Control bus system):
Bidirectional interface used to control a consumer VCR

Supplied Remote Commander



❶ EJECT button

Note

The unit does not open and close Cassette Lid ❺ *(page 8)* automatically. When you eject a tape by using EJECT button on Remote Commander, open Cassette Lid beforehand, then press EJECT button.

❷ SEARCH SELECT buttons

Press these buttons to search for scenes using the search function.

For details on the search function, see "Searching using the search function" on page 30.

❸ Buttons for playing at various speeds

You can play back a tape at normal speed or at a speed other than normal with these buttons.

For details, see "Playing at various speeds" on page 29.

❹ PAUSE button

❺ REW (rewind) button

❻ PLAY button

❼ FF (fast forward) button

❽ STOP button

❾ REC (record) buttons

When you press both these buttons at the same time, REC indicator and PLAY indicator on the front panel light and recording begins.

❿ INDEX WRITE button

Press this button during recording to mark an index.

For details on an index, see "Marking an index" on page 36.

⓫ DATA CODE button
Press this button to display the data codes (recording date/time, camera data).
For details on data codes, see "Displaying information (data codes) recorded on a tape" on page 28.

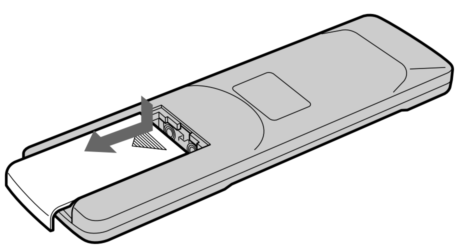
⓬ ⏻ (on/standby) switch

Notes

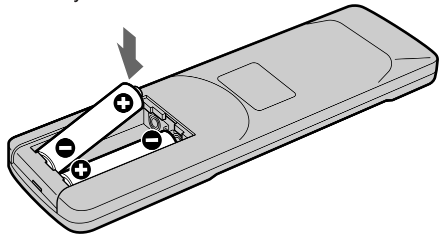
- The command mode of the supplied Remote commander is set to VTR4.
- Set [COMMANDER] in [OTHERS] menu to [WIRELESS] to enable Remote Commander to control the unit.
- In addition to Remote Commander supplied with the unit, the unit accepts signals from any Sony Remote Commander whose command mode is set to VTR4. To disable the control from Remote Commander, set [COMMANDER] in [OTHERS] menu to [CONTROL S].

Battery installation

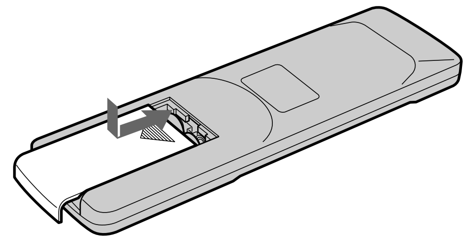
1 Push and slide the lid to open.



2 Install two size AA (R6) batteries (supplied) with the correct polarity.



3 Put the lid back.



Notes on batteries

- Make sure that the battery orientation is correct when inserting batteries.
- Do not mix an old battery with a new one, or mix different types of batteries.
- If you do not intend to use Remote Commander for a long time, remove the batteries to avoid damage from battery leakage. If the batteries have leaked, remove them, wipe the battery compartment dry and replace the batteries with new ones.

To remove the batteries

Remove the lid as step **1** and take out the batteries.

> **WARNING**
> Battery may explode or leak if mistreated. Do not recharge, disassemble or dispose of in fire.
> Check the valid date (month-year) displayed on the batteries.

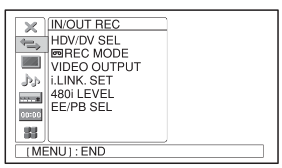
Displaying Various Data

The unit can display various superimposed text data on an external monitor connected to the unit.

In this operation manual, the menu screen etc. is displayed in English. You can change the desired language with the screen language setting.
For details, see page 53.

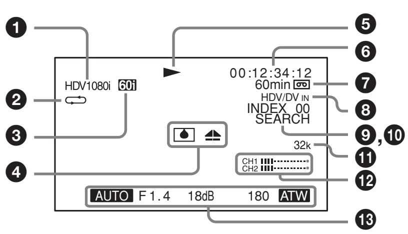
Menu screen

Press MENU button to display the menu screen. You can change or check the menu item settings on this screen.
For details on the menu, see "Chapter 4 Adjusting and Setting Through Menus" on page 44.



Data display screen

You can check important information for normal recording or playback, such as time code or remaining tape time, on the screen.



❶ Format indicator
[HDV1080i], [DVCAM], or [DV SP] are displayed.

❷ Repeat indicator
Displays the repeat indicator when [AUTO REPEAT] in [VTR SET] menu is set to [ON].

❸ 60i/50i indicator

❹ Alarm indicator
Displays an alarm indicator.
For details on alarm indicators, see "Warning indicators and messages" on page 62.

❺ Tape transport mode indicator
Displays the tape transport mode.

❻ Time code indicator
In the drop frame mode, a period is displayed between the minutes and seconds (i.e., 00:12.58:00).

Note
When you play back a tape without having the time code set or the time code unrecognized on the unit cannot be displayed correctly.

❼ Remaining tape time indicator
Displays the remaining tape time.
For details, see "REMAINING" on page 49.

Note
When you insert a cassette in which the tape has been rewound to the beginning, this indicator will not show the remaining tape time. The remaining tape time is displayed after the tape runs for a while.

❽ INPUT SELECT indicator
Changes according to the position of INPUT SELECT switch ([HDV/DV IN], [S VIDEO IN], or [VIDEO IN]).

❾ (Index) indicator
Displays when an index has been marked.

❿ Search indicator
Displays the search mode when you search for scenes using Remote Commander.
For details on the search function, see "Searching using the search function" on page 30.

⓫ Audio mode indicator
In the recording mode, displays 32k when you select [FS32K] for [AUDIO MODE] in [AUDIO SET] menu. When you select [FS48K], 48k is displayed. During playback, displays the audio mode recorded on the tape. During i.LINK input, displays the audio mode of the signal input to HDV/DV jack.

Notes
- The audio mode will not be displayed when [HDV/DV SEL] in [IN/OUT REC] menu is set to [HDV].
- Signals other than HDV/DVCAM lock mode will become non-standard audio and NS32k/NS48k is displayed during playback or when the signal is input from HDV/DV jack.

⓬ Audio level meters

For details of the audio level meter display, see “AUDIO MIX” in “AUDIO SET” menu on page 50.

⓭ Date/time and camera data indicator

When you press DATA CODE button of Remote Commander or when you select [DATE] or [CAMERA DATA] of [DATA CODE] in [DISPLAY SET] menu, you can switch the display between recordings date/time and camera data.

For details on the date/time and camera data indicator, see “Displaying information (data codes) recorded on a tape” on page 28.

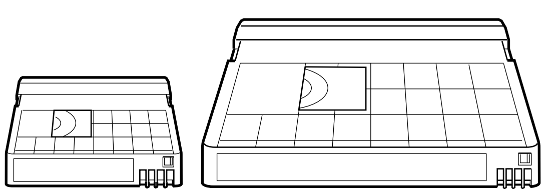
Chapter 2

Playback and Recording

Notes on Power Supply and Video Cassettes

Usable cassettes

We recommend you to use a DigitalMaster™ cassette of standard HDV/DVCAM/DV cassette (such as PHDV-276DM), or mini HDV/DVCAM/DV cassette (PHDVM- 63DM) for recording in HDV/DV format.
We recommend you to use a standard DVCAM cassette, Mini-DVCAM cassette, or DigitalMaster™ described above for recording in DVCAM format.

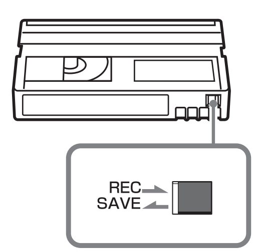


Cassette memory

Some Mini cassettes and standard cassettes have the cassette memory (mark). The unit, however, does not support cassette memory.
However, if you use the DSR-25/45/50 as a recorder, the unit accesses cassette memory only if the recorder is set to [AUTO].

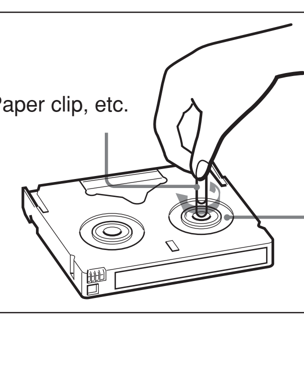
To save a recording

To prevent accidental erasure of a recording, set REC/SAVE switch on the cassette to SAVE. To record or dub audio on a tape, set the switch to REC.



Checking the tape for slack

Using a paper clip or a similar object, turn the reel gently in the direction shown by the arrow. If the reel does not move, there is no slack.



Preparing the Power Supply

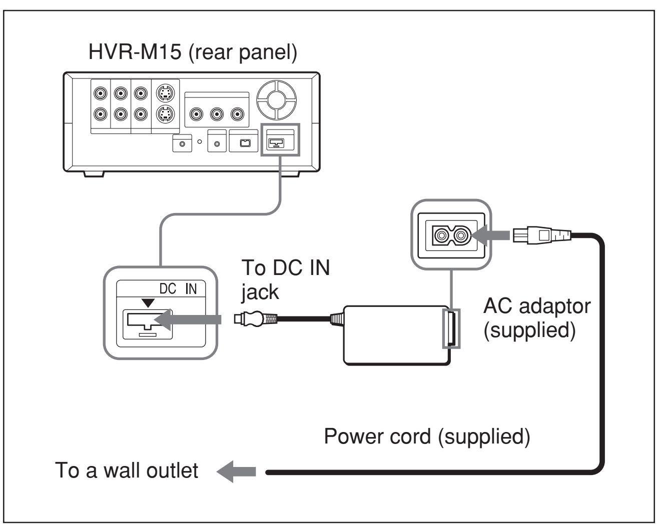
Connect the power cord (supplied) to the AC adaptor (supplied) and the DC plug of the AC adaptor to DC IN jack on the unit. Next, connect the power plug to an AC outlet. When you disconnect the power cord, be sure to unplug the power cord from the AC outlet first.

PRECAUTION

Even if this unit is turned off, AC power (house current) is still supplied to it while connected to the wall outlet via the AC adapter.

Notes

- Never short-circuit the DC plug of the AC adaptor with a metal object. A short circuit can damage the unit.
- Use a nearby wall outlet when using the AC adaptor. Disconnect the AC adaptor from the wall outlet immediately if any malfunction occurs.
- Do not use the AC adaptor placed in a narrow space, such as between a wall and furniture.



[CLOCK SET] screen appears when you turn on the unit for the first time.

Refer to page 54 on how to set the date and time.

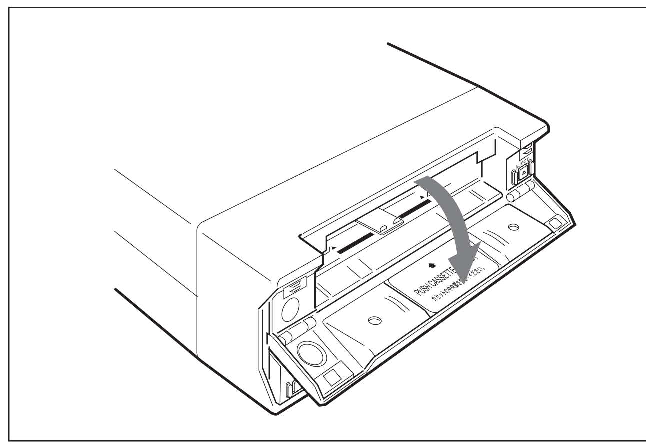
Inserting/Ejecting Cassettes

To insert a cassette

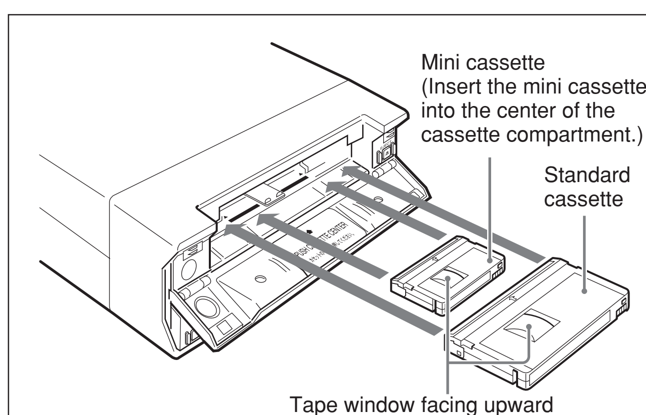
Notes

- Do not insert the cassette forcibly. The unit may be damaged.
- Do not eject/load the cassette in a place subject to light. Close Cassette Lid when the unit is in use. The internal sensor of the unit may operate incorrectly if too much light falls on the unit.

1 With the unit powered on, confirm that ▭ indicator is off, then open Cassette Lid.



2 After checking the tape for slack, hold the cassette so that the tape window is facing upward, then insert it into the unit.
The tape is inserted into the unit automatically.



(Continued)

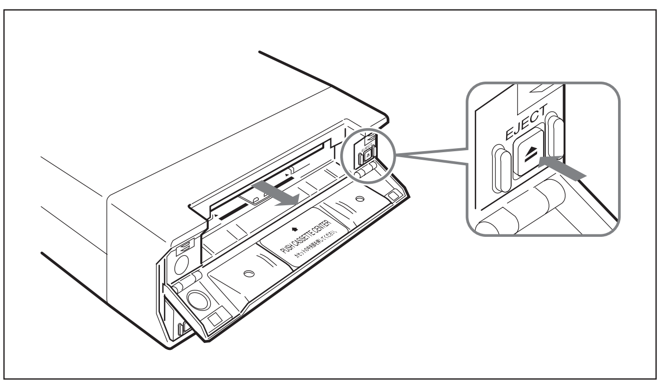
Notes

- When inserting a cassette, hold the back edge of the cassette in the center and push it until the cassette is inserted deep into the unit. If you hold the ends, the cassette may not be loaded properly.
- If the cassette does not load or is loaded only halfway, eject it once, and then insert it again. In such a case, if you insert the cassette forcibly, the cassette may not be loaded properly or malfunctions may occur.
- It takes a few seconds for the unit to recognize the cassette and find the proper location on the tape being loaded.

3 Close Cassette Lid.

To eject the cassette

1 With the unit powered on, open Cassette Lid. Press EJECT button located at the right side of the cassette compartment.



The cassette is unloaded and ejected.

2 Remove the cassette from the unit. Close Cassette Lid.

Notes on Playback/Recording

No compensation for contents of the recording

Contents of the recording cannot be compensated for if recording or playback is not successful due to a malfunction of the unit, video tape, etc.

Copyright precautions

Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the copyright laws.

On recording

You cannot record or output EE signals to any software having copyright protection signals on the unit. If you start recording protected video and audio signals, a warning appears on the monitor screen and the unit stops recording.
During recording, do not change INPUT SELECT switch setting. If you do so, the unit may mistakenly recognize that a copyright control signal has been input.

On playback

When you play back software having copyright protected signals on the unit, you may not copy or output to other equipment.

Limitations caused by differences in format

The unit can record and play back tapes recorded in HDV (1080/60i, 1080/50i), DVCAM, or DV format. However, due to differences in format, you may not play back or edit some tapes affected by recording conditions of the tape (i.e., a tape originally recorded in DV format is dubbed in DVCAM format).
The unit cannot input/output, record, or play back a tape other than 1080/60i or 1080/50i format such as 1080/30F, 1080/25F, 1080/24F, 720/25p, 720/24p format.
The unit cannot input/output, record, or play back a tape with 4-channel audio signals in HDV extended format.
You can play back HDV720/30p format, while you cannot output the video signals from i HDV/DV jack.
For details, see "Compatibility of HDV, DVCAM, and DV Formats" on page 68.

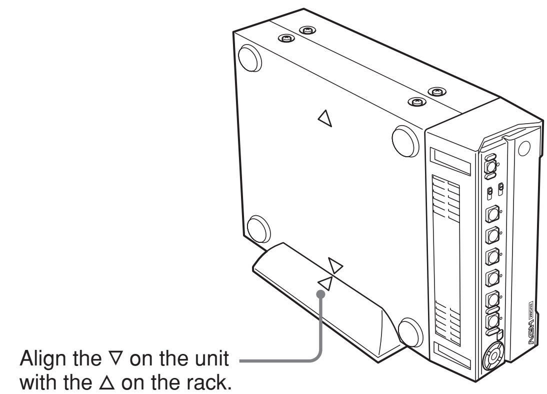
If a tape has both a portion recorded in HDV/DVCAM format and one recorded in DV format (SP mode), the following limitations are applied when you play back the tape with the unit:
- The image may be distorted and noise may occur at the point where the recording format changes on the tape.
- The tape transport control buttons may be disabled until the tape speed is stabilized.

Note on playback on other equipment

A tape recorded in HDV format using the unit cannot be played back with the devices not compatible with HDV1080i format. We recommend you to play back the tape for checking the contents before you actually play back the tape on other video equipment.

Installing the Unit Vertically

Put the unit into the supplied rack as illustrated below. You can install it either standing on its left side or on its right side.



Notes

- Be sure to use the supplied rack. Without the rack, the unit may topple over and may be damaged or may cause injury.
- Install the unit on a flat place.
- When inserting a cassette, hold the unit until it is loaded into the unit. Otherwise the cassette may fall out and the tape may be damaged.
  For details on inserting a cassette, see "Notes on Power Supply and Video Cassettes" on page 20.
- The name plate is located on the left side of the unit. You may not see it when using the supplied rack.

Chapter 2 Playback and Recording

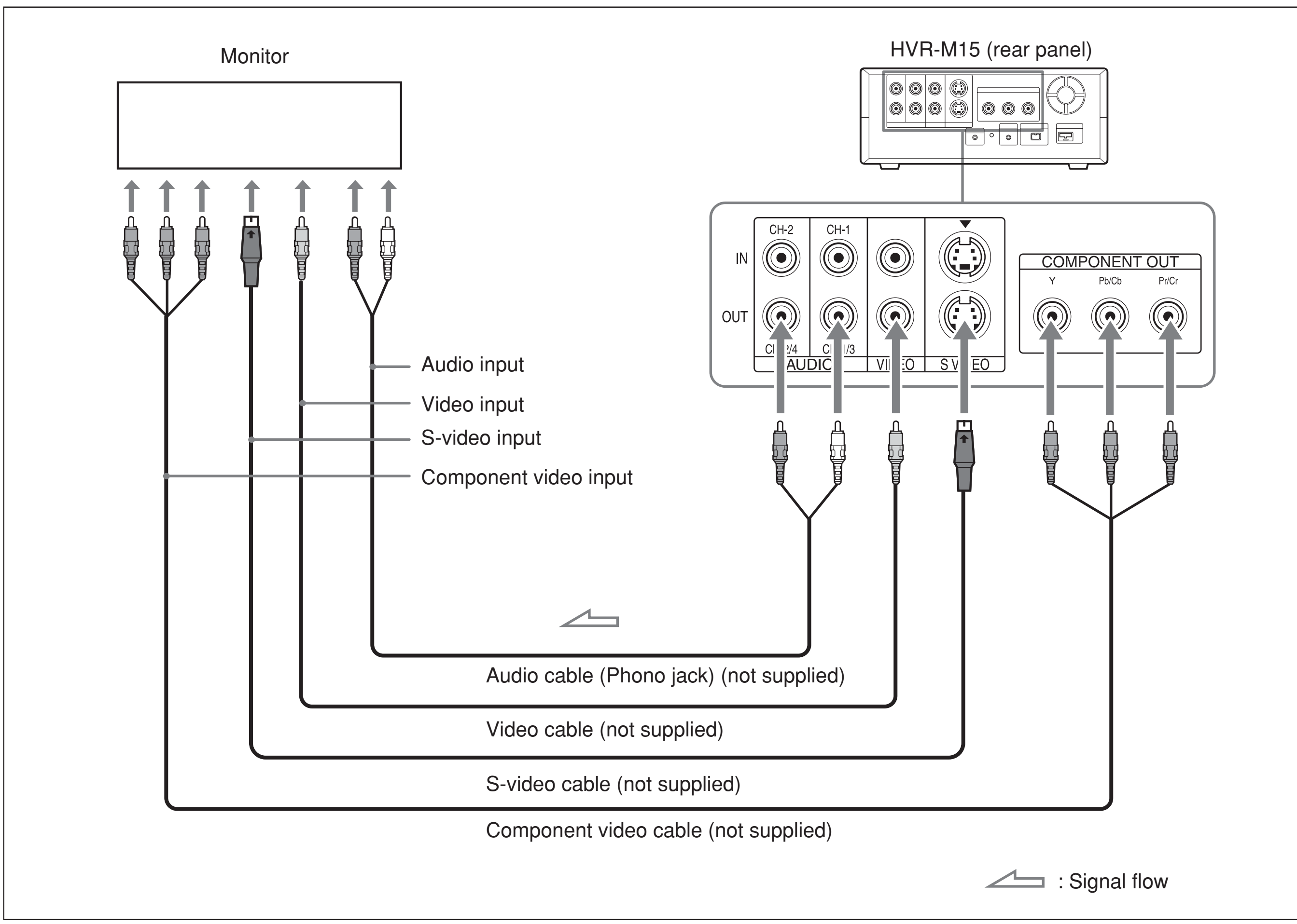
Playback

This section describes the connections and settings for the playback and functions such as playback at various speeds and searching for a specific scene on a recorded tape.

Connections for Playback

Connecting the unit to a monitor without an i.LINK jack

You can connect the unit to video monitor without an i.LINK jack. Use the unit as follows.

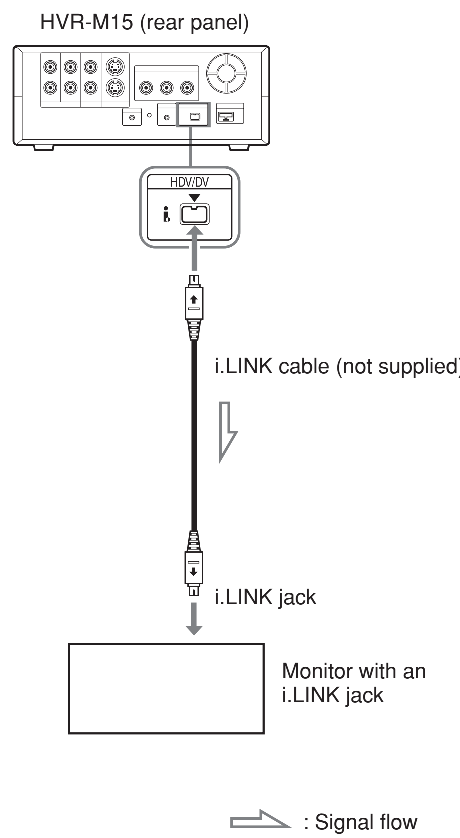


Notes

- To playback the picture recorded in HDV format when you connect the monitor using a component video cable, set [COMPONENT] of [VIDEO OUT] in [IN/OUT REC] menu according to your monitor *(page 47)*. When the picture recorded in DVCAM/ DV format is played back, only a picture with a quality equivalent with DVCAM/DV format of 480i (NTSC) or 576i (PAL) is output via COMPONENT OUT jacks regardless of [COMPONENT] setting.
- For details on output level from COMPONENT OUT jacks, see "Specifications" *(page 75)*.
- To change the output level from COMPONENT OUT jacks, see [480i LEVEL] in [IN/OUT REC] menu *(page 48)*.
- If you connect the input connectors of the unit to the output connectors of a monitor, a humming noise may be generated or the image may be distorted. If these phenomena occur, use INPUT SELECT switch to select a signal that is not being input or disconnect the cables.
- When you play back an HDV-formatted tape with copyright protected signals or input i.LINK signals with copyright protection to i HDV/DV jack, pictures may be output in either 480i (NTSC) or 576i (PAL) format regardless of the setting of [COMPONENT] of [VIDEO OUT] in [IN/OUT REC] menu.
- The unit cannot up convert DVCAM/DV recordings to HDV at output.

Connecting the unit to a monitor equipped with an i.LINK jack

The video and audio signals are sent with hardly any degradation, enabling high-quality playback to a monitor with an i.LINK connector which supports HDV, DVCAM, and DV format.



Notes

- Be sure that you set [HDV/DV SEL] in [IN/OUT REC] menu to [AUTO] (default setting) before connecting the video equipment to the unit with the i.LINK cable. If you change the setting after connecting the i.LINK cable, the monitor may not recognize the video signal correctly *(page 46)*.
- To connect the unit to a monitor equipped with an i.LINK jack, you may need to adjust the monitor settings so that it recognizes the unit.
  For details, refer to your monitor's instruction manual.
- When i.LINK is connected, the unit cannot output video or audio only.

(Continued)

- If you connect the input connectors of the unit to the output connectors of a monitor, a humming noise may be generated or the image may be distorted. If these phenomena occur, use INPUT SELECT switch to select a signal that is not being input or disconnect the cables.
- To connect i.LINK cable between a monitor and the unit, use an HDV or DV-compatible monitor. To play back a tape recorded in HDV mode on a DV-compatible monitor, set [HDV → DV CONV] of [i.LINK SET] in [IN/OUT REC] menu to [DVCAM] or [DV SP] before connecting the unit with the i.LINK cable.
  For details, refer to your monitor's instruction manual.
- Some general consumer television sets are provided with a function to control equipment connected with the i.LINK cable. Such a function, however, may not work with the unit.

Settings for Playback

Preparation on the unit

Notes

- Text information is superimposed to VIDEO OUT jack, S VIDEO OUT jack, and COMPONENT OUT jacks. To record video signals without text data, set DISPLAY OUTPUT switch to OFF *(page 8)*.
  For details on text data, see "Displaying Various Data" on page 18.
- To view a tape recorded in HDV format by connecting the unit to a monitor set that has a 4:3 aspect ratio, set [DOWN CONVERT] of [VIDEO OUT] in [IN/OUT REC] menu to the desired mode *(page 47)*.

1 Power on the monitor, then set the monitor's input switch according to the signals input.

2 Turn the unit on.

Playback Procedures

1 Insert a cassette and confirm that (cassette) indicator lights.

2 Press PLAY button on the unit.

The unit starts playback.

To stop playback
Press STOP button on the unit.

To pause playback
Press PAUSE button on the unit.

Notes

- If the unit is playing a portion of a tape where the recording format changes between HDV, DVCAM, and DV, the picture and sound are distorted on such portions.
- You cannot play back an image recorded in DV (LP) mode on the unit.
- If the unit is playing a tape recorded with mixed video signals of the 60i system and 50i system, the picture and sound will be distorted on a portion of a tape where the recording system changes.
- During pause, the picture recorded on a tape in HDV format cannot be output from i HDV/DV jack.

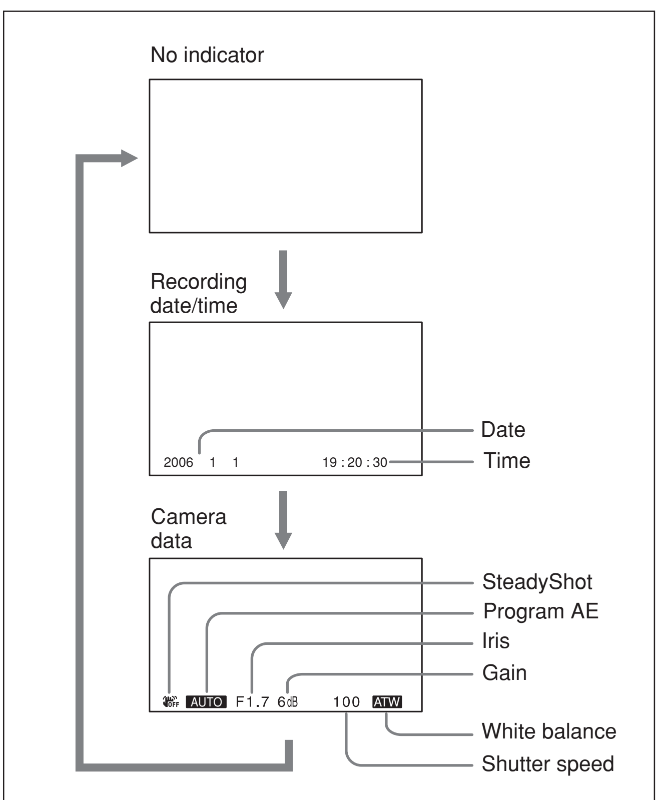
Playback Functions

This section describes useful functions during playback.

Displaying information (data codes) recorded on a tape

If you record on a tape using a Sony digital HD video camera recorder or digital camcorder, the recording information (data codes) will be recorded on the tape. The data codes consist of recording date/time and camera data (the shutter speed, SteadyShot, iris, white balance, program AE mode, gain, date and time).
You can check these data items during playback on the unit.

Each time you press DATA CODE button on Remote Commander, the display changes in sequence as follows:
no data code → recording date/time → camera data → no data code ..... Also, you can change the display by setting [DATE] or [CAMERA DATA] of [DATA CODE] in [DISPLAY SET] menu.
For details, see "DATA CODE" on page 49.



Notes
- If the data codes were not recorded, "- - -" appears instead.
- The unit cannot record camera data.
- Some of the camera data items displayed by the unit are different from those shown on the digital camcorder and digital HD video camera recorder.

Playing at various speeds

You can play back a tape at various speeds using Remote Commander.

HDV-formatted tape

Button	Operation speed	Panel/analog output		i.LINK output	
		Forward direction	Reverse direction	Forward direction	Reverse direction
× 1/10	One-tenth of normal speed	◎	—*	—	—*
× 1/3	One-fifth of normal speed	◎	—*	—	—*
× 1	Playback at normal speed	◎	○	◎	○
× 2	Playback at normal speed	—*	—*	—*	—*
FRAME ◀II/II▶	Frame-by-frame forward scanning	◎	—*	—	—*
⏪/⏩	8× speed	○	○	○	○

* The output will be the same as that of ×1.
◎ : Play at normal speed.
○ : A search simple image is output. (Rough image)
— : No playback takes place.

DVCAM/DV-formatted tape

Playback options	Operation
Play at 1/10 of normal speed	Press × 1/10 button during playback.
Play at 1/3 of normal speed	Press × 1/3 button during playback.
Play at normal speed	Press × 1 button during playback.
Play at twice the normal speed	Press × 2 button during playback.
Play frame by frame	Press FRAME ◀II/II▶ buttons during pause. If you keep pressing one of these buttons, playback continues, frame by frame.
Fast forward the tape while monitoring pictures	Press ⏩ button during normal playback or when playing at various speeds.
Rewind the tape while monitoring pictures	Press ⏪ button during normal playback or when playing at various speeds.

To change playback direction

Press FRAME ◀II/II▶ buttons during normal playback or when playing at various speeds. To play back in the forward direction, press II▶ button; in the backward direction, press ◀II button.

Notes

- When the command mode of a Sony device/remote commander is set to VTR4:
  – if you press ×1/3 button on the supplied Remote Commander while pointing it toward a Sony device other than the unit, the playback speed may turn to 1/5 of normal speed.
  – when you playback a tape in DVCAM/DV format and press ×1/5 button on Remote Commander while pointing it toward the unit, the playback speed turns to 1/3 of normal speed.
- If the unit keeps playing at 1/10 of normal speed in forward or reverse for more than 1 minute, the unit will begin to play back forward at normal speed.

To hear the sound while playing at various speeds

To hear the sound when playing at various speeds, set [JOG AUDIO] in [AUDIO SET] menu to [ON].

For details on [AUDIO SET], see "AUDIO SET" menu on page 51.

Note

You cannot hear the sound while playing back a tape recorded in HDV format at various speeds.

Searching using the search function

The unit can immediately access the following signals recorded on a tape.

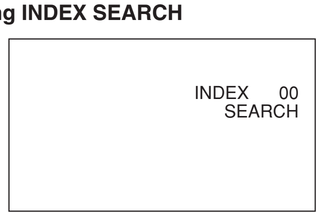
– Searching for the beginnings of the recordings: Index search
– Searching for a point on the tape where the recorded date changes: Date search

To search for scenes, use the supplied Remote Commander.

1 Press SEARCH SELECT button on Remote Commander to select the search type.

The search type will change in the order of Index search → Date search → (No indication).

When selecting INDEX SEARCH



(The search screens are displayed only on Data display screen)

2 Press ⏮ or ⏭ button repeatedly to locate the scene you want.

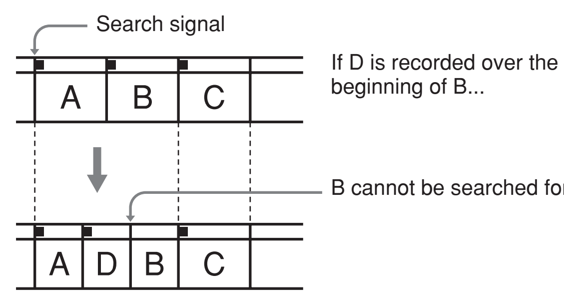
Each time you press ⏮ or ⏭ button, the unit searches for the previous or next search point. When a search point is located, its number is indicated on the monitor screen.
The unit starts searching backwards or forwards until the number comes to zero, then plays back the scene.

How signals are recorded

There are four different signal types, one for each search method; index, title, date and photo signals. The unit can record either index signals or date signals only on a tape.

Notes

- If you record another program over the beginning of the search signals, you cannot locate the original program.



- The interval of a date or index must be 2 minutes or more. If the interval is short, the search signals may not be detected correctly.
- If non-recorded portions are included in the middle of a tape, signal search may not be performed correctly.
- You cannot add search signals after recording.
- The unit does not support reading and marking Index search signals on cassette memory. For duplicating with the DSR-25/45/50, see page 20.
- Searching may not be done correctly if the tapes were not recorded on Sony-brand digital video equipment.

Auto Repeat

The unit can repeat the playback of all or a part of the tape.

1 Set [AUTO REPEAT] in [VTR SET] menu to [ON].

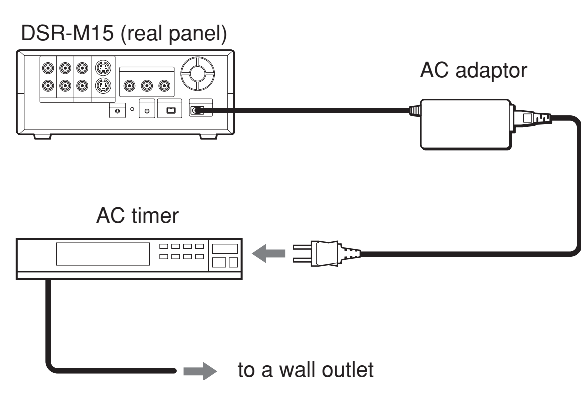
2 Press REW button (if the tape is already rewound, press PLAY button).

The unit rewinds the tape to its beginning, and starts playback automatically. When the following items on the tape are searched, AUTO REPEAT playback starts automatically.
– Index signals
– A portion unrecorded
– A portion recorded in the format set by other than [AUTO] in [HDV/DV SEL] in [IN/OUT REC] menu
– Tape end

Auto Repeat using an external AC timer

If you connect an external AC timer (not supplied) to the unit, you can repeat playback automatically at the preset time.

1 Connect the unit to an external AC timer to the unit.



2 Set [AUTO REPEAT] in [VTR SET] menu to [ON].
⮂ is displayed on the Data display screen *(page 18)*.

3 Set the starting time on the external AC timer.

At the preset time, the power of the unit turns on, and after a few seconds (no more than 30), Auto Repeat playback starts automatically. When the following items on the tape are searched, AUTO REPEAT playback starts automatically.
– Index signals
– A portion unrecorded
– A portion recorded in the format set by other than [AUTO] in [HDV/DV SEL] in [IN/OUT REC] menu
– Tape end

Notes

- The unit cannot search for an unrecorded portion for 20 seconds at the beginning of the tape until it searches for the next unrecorded portion throughout the tape.
- While a tape is running, be sure not to turn off the power by using an AC timer. The unit and the tape may be damaged. When turning off the power of the unit, make sure to press STOP button on the unit first to stop the tape transport, then turn off the power.
- The editing software used on the digital non-linear editing system may mark an index signal on a tape itself. Therefore, if you use a tape on which signals transmitted from a digital non-linear editing controller are recorded or a copy tape made from one, using digital dubbing, Auto Repeat may not be performed correctly.

To stop Auto Repeat

Press STOP button on the unit.

To release the Auto Repeat mode

Set [AUTO REPEAT] in [VTR SET] menu to [OFF].

Using the Unit as a Videocassette Recorder

This section describes the connections, settings and operations necessary to perform recording on the unit. The same settings and operations apply whether you are using the unit for dubbing.

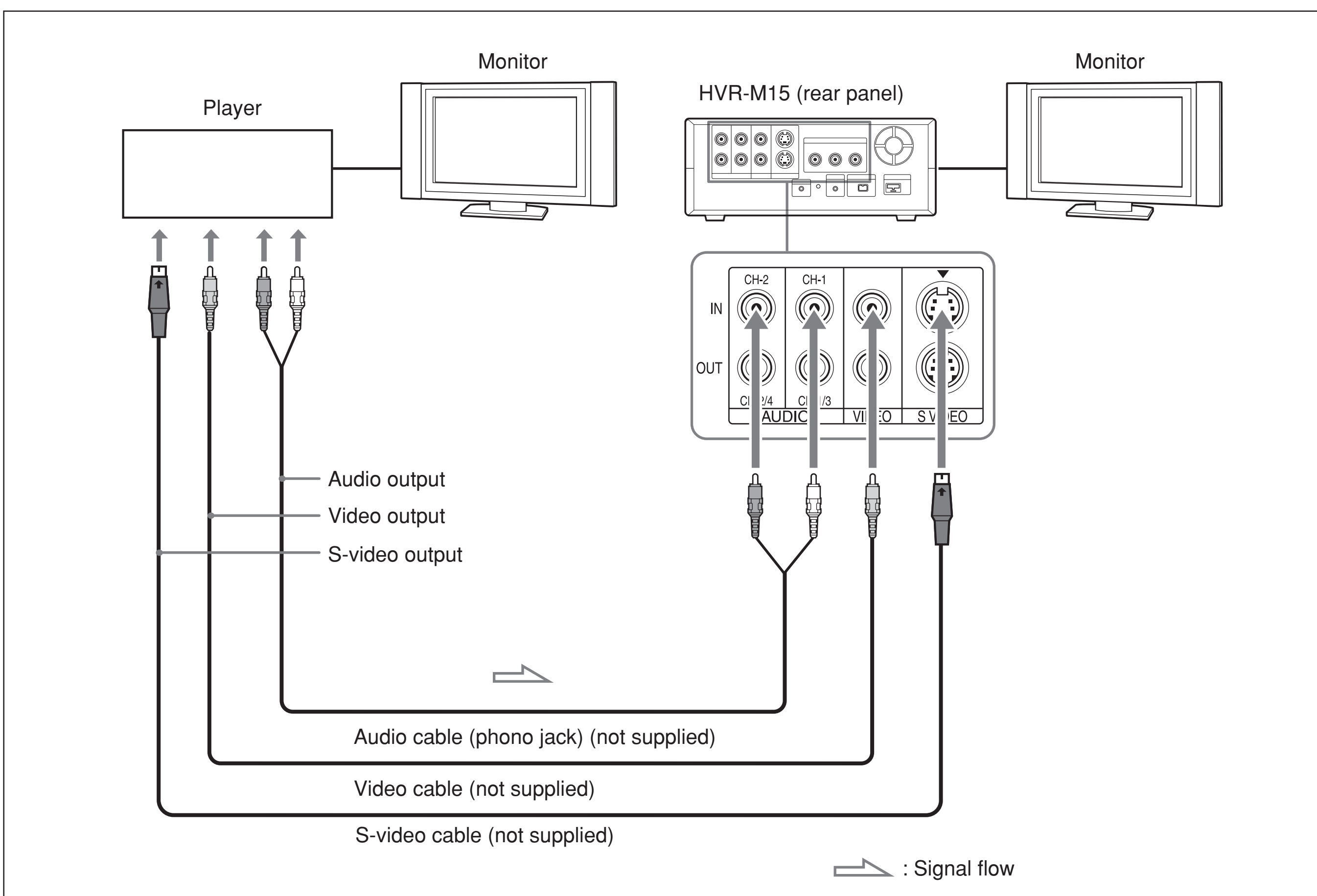
Notes

- For connection of the editing devices, refer to the instruction manual of the editing controller and that of the editing software you use.
- Edit functions are specified by the editing software. For details on the editing methods, refer to the instruction manual of the editing software.
  For details, see also pages 41, 42, 43.

Connections for Recording

To video equipment without an i.LINK jack

You can connect the unit to video equipment without an i.LINK jack. Use the unit as a recorder as follows.



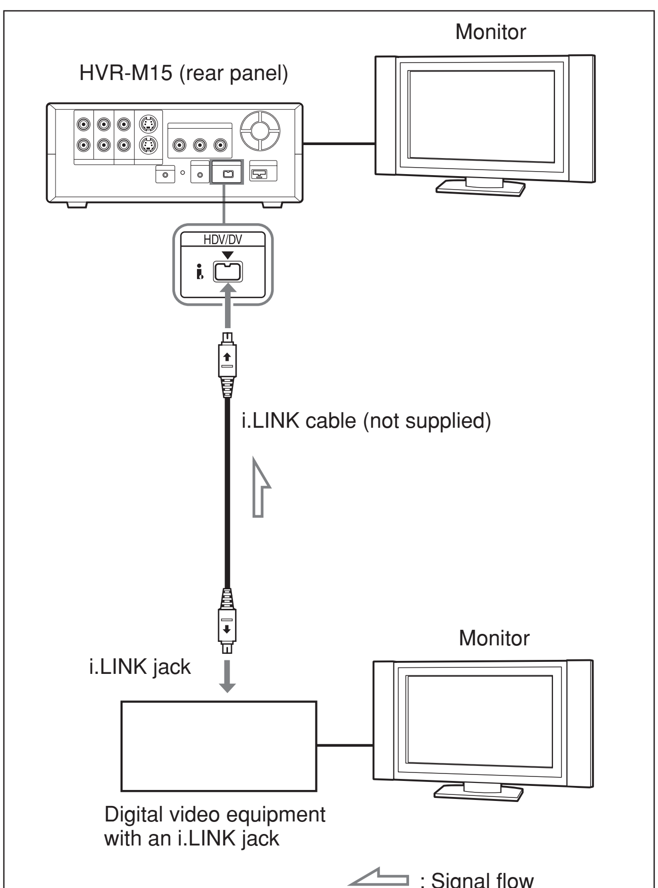
Connect either an S-video cable or a video cable.

Notes

- If you connect the output connectors of the unit to the input connectors of the player, a humming noise may be generated or the image may be distorted. If these phenomena occur, set INPUT SELECT switch to a position where a signal is not currently being input, or disconnect the cables.
- Distorted signals (i.e., when played back at a speed other than normal) may not be recorded or may be distorted.
- When you connect only AUDIO IN jacks when HDV indicator is lit, no audio is input. You must connect VIDEO IN jack at the same time or set [HDV/DV SEL] in [IN/OUT REC] menu to [DV].

To digital video equipment with an i.LINK jack

When you record i.LINK signal of HDV (1080/60i, 1080/50i), DVCAM, or DV format, the video and audio signals are sent without any degradation in quality, enabling high-quality recording. The signal flow is automatically detected so you do not need to make separate connections for input and output.



Notes

- When you record video from HDV-compatible equipment, set [HDV/DV SEL] in [IN/OUT REC] menu to [AUTO]. To record video from a DVCAM/ DV equipment, set [HDV/DV SEL] in [IN/OUT REC] menu to [AUTO] or [DV] before connecting the i.LINK cable *(page 46)*. If you change the setting after connecting the i.LINK cable, the video equipment may not recognize the video signals correctly.
- Copy-protected program such as digital broadcast cannot be input via i HDV/DV jack.
- With HDV/DV connection, the sound is recorded in the same audio recording mode as that of the source tape. To record in a different audio recording mode from the source tape, connect as shown in "To video equipment without an i.LINK jack" on page 32.
- With HDV/DV connection, data codes (recording date/time, camera data) recorded on the source tape are transmitted to the recorder (the unit). As a result, when you play back a recorded tape on the unit and press DATA CODE button on Remote Commander, the same data codes as those recorded on the source tape are displayed on the monitor screen.
- If no picture appears via i HDV/DV jack, disconnect the i.LINK cable, then reconnect it.
- If you record a picture in the playback pause mode, the image may be distorted.
- The unit cannot record video or audio separately.
- If you restart recording after a pause or stop, the images recorded before and after restarting operation will not be continuous.
- When connecting a device that has a 6-pin i.LINK jack to the unit, first, connect the plug of the cable to the 6-pin i.LINK jack.
- If the unit is connected to a device equipped with a 6-pin i.LINK jack, when you intend to disconnect or reconnect the i.LINK cable, turn off the device and pull out the plug of its power cord from the AC outlet beforehand. If you connect or disconnect the i.LINK cable while the device is connected to the AC outlet, high-voltage current (8 to 40 V) is output from i.LINK jack of the device to the unit, which may cause a malfunction.
- If you connect the output connectors of the unit to the input connectors of a player or that of a monitor, a humming noise may be generated or the image may be distorted. If these phenomena occur, use INPUT SELECT switch to select a signal that is not being input or disconnect the cables.

(Continued)

- The unit cannot record MPEG2 signals except HDV1080i signals.
- When you record HDV signals input from i HDV/DV jack, the connection between the recorded picture pauses for a second.

Settings for Recording

Preparation on the recorder (the unit)

Notes

- Before recording, set the date and time on the unit so that the recording time can be written into the search signal. You can set the date and time by setting [CLOCK SET] in [OTHERS] menu *(page 54)*.
- Editing may not be possible with a signal that is copyright protected.
- During recording, the tape transport control buttons (except STOP and PAUSE) are disabled to prevent the tape running mode from being changed by an incorrect operation.

1 Turn the power on the monitor, then set the monitor's input according to the input signals.

2 Set up the player to play back a tape.
For details, refer to the instruction manual of the player.

3 Turn the unit on.

4 When the player is connected to IN jacks on the unit, set [60i/50i SEL] in [OTHERS] menu according to the input signals.

When you input 60i system signals, set [60i/50i SEL] to [60i]. When you input 50i system signals, set [60i/50i SEL] to [50i] *(page 55)*.

Notes

- Do not change [60i/50i SEL] setting during recording.
- When you select S VIDEO or VIDEO with INPUT SELECT switch, if the field frequency of the input signals is different from that of [60i/50i SEL] setting, the picture mutes.
- When the signals are input through the i.LINK interface, the unit detects the field frequency of the input signal automatically. You do not need to change [60i/50i SEL] setting. When [60i/50i SEL] is set to [50i], however, the time code generated by the unit is fixed to the non-drop frame mode. Even if 60i system signals are input to i.LINK jack, the time code generated by the unit is the non-drop frame mode, regardless of [TC FORMAT] setting in [TC/UB SET] menu. If you intend to record the unit to generate the time code in the drop frame mode, set [60i/50i SEL] to [60i].

5 Select an input signal by switching INPUT SELECT switch on the unit.

HDV/DV : to record input signals from i HDV/DV jack
S VIDEO : to record input signals from S VIDEO IN jack
VIDEO : to record input signals from VIDEO IN jack

You need to adjust [HDV/DV SEL] and [REC MODE] *(page 46)* in [IN/OUT REC] menu to your desirable recording format.
For details of the recording tape format, see page 72.

Note

Do not change INPUT SELECT switch setting during recording. If you change the setting of this switch during the recording, the recording will stop for several seconds. Recording will restart after the internal circuits are switched. During this time, no image is recorded.

6 If INPUT SELECT switch is set to S VIDEO or VIDEO, select the audio mode. (With a i HDV/DV connection, skip step 6, 7, and 8.)

When you select S VIDEO or VIDEO with INPUT SELECT switch, set AUDIO mode by setting [AUDIO MODE] in [AUDIO SET] menu *(page 50)*.

FS32K : Switches the audio mode to 4-channel mode.
FS48K : Switches the audio mode to 2-channel mode.

When recording a tape in DV (SP), you can set AUDIO LOCK mode with [AUDIO LOCK] in [AUDIO SET] menu *(page 51)*.

Note

When signals are input from i HDV/DV jack, those signals input to the recorder with the audio mode are the same as the signals input from the unit with the audio mode.

7 Select the recording level adjustment mode using [AUDIO AGC] in [AUDIO SET] menu.

Notes

- You cannot adjust recording level if you record signals input via i HDV/DV jack.
- For connecting the unit to a device that does not have an i.LINK jack, the sound is recorded on CH1/2 when the audio mode is set to [FS32K] (4-channel mode).

8 Adjust the audio recording level with [AUDIO REC LV] in [AUDIO SET] menu, if necessary *(page 50)*.

You can adjust [AUDIO REC LV] only when you have selected [OFF] in step **7**.
Make sure not to exceed 0 dB at maximum volume, or sound distortion occurs.

Notes

- To record in DVCAM and DV (SP) format, there are two audio modes which you can select, with either 2-channels at FS48K or 4-channels at FS32K. It is not possible to select other modes (for example with 2-channels at FS32K).
- During recording, you cannot change the audio mode.
- If you intend to dub audio after recording, select whether [DVCAM] or [DV SP] of [REC MODE] in [IN/OUT REC] menu according to the unit you will use for audio dubbing. Then, set [AUDIO MODE] in [AUDIO SET] menu to [FS32K] (4-channel mode) before recording *(page 50)*. (The unit does not have an audio dubbing function.)

Recording Procedures

This section describes the procedures used to record signals sent from another VCR to the unit. For details on the operation when the unit is connected to a computer via i HDV/DV jack, refer to “Editing (Connecting with a Computer)” *(page 41)*.

1 Insert a cassette and confirm that (cassette) indicator is lit.

2 Press the playback button on the player.

The player starts playback.

3 On the unit, press PLAY button while holding REC button down.

Note

When the unit records HDV format images, it takes a while until recording starts. This delay, however, is not a malfunction. ([STANDBY] and REC indicator on the Data display screen will blink until recording starts.)

To stop recording

Press STOP button on the unit.

To pause recording

Press PAUSE button on the unit.

Note

You cannot up convert NTSC or PAL signals in HDV format for recording.

Recording Functions

Marking an index

By pressing INDEX WRITE button on Remote Commander during recording, you can mark an index signal at any place on the tape. If you mark an index at the scene you want to search for, you can easily find the scene later.
When [AUTO INDEX] in [VTR SET] menu is set to [ON], if you start recording while the tape in stop, the unit automatically marks an index. While the index is being marked, indicator appears for about seven seconds on the Data display screen *(page 18)*.

Notes

- You cannot mark a new index while indicator is being displayed.
- If you record on a portion of the tape where an index has been marked, the index will be erased. You cannot delete just an index while keeping the image or sound.
- You cannot mark an index during playback operations. INDEX WRITE button is disabled in these operations.

To use an index during playback

See “Searching using the search function” on page 30.

Chapter 3

Dubbing/Editing

Dubbing to another equipment

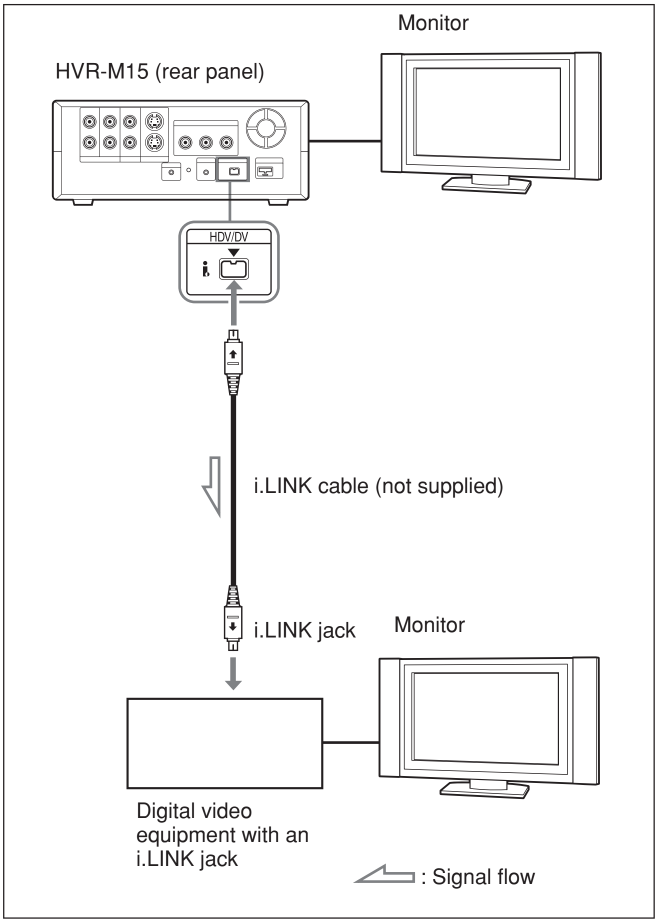
The section describes the connections and settings necessary to perform dubbing on other equipment, using the unit as a video player.

Connections for Dubbing

To digital video equipment with an i.LINK jack

Connect the unit to the recorder as shown right using an i.LINK cable.
The signal flow is automatically detected so you do not need to make separate connections for input and output. Also, connecting the unit to an editing controller via i. HDV/DV jack, you can configure a digital non-linear editing system.
For connections of the editing controller and the unit, refer to the editing controller instruction manual.

Before dubbing, you must set the format in which you want to output signals. Perform [HDV/DV SEL] *(page 46)* and [i.LINK SET] *(page 47)* settings in [IN/OUT REC] menu.
For details, refer to "Compatibility of HDV, DVCAM, and DV Formats" (page 68).



(Continued)

Dubbing to another equipment

To dub a tape recorded in HDV format using duplicate function on such as the DSR-25/45/50, select [DVCAM] in [HDV → DV CONV] of [i.LINK SET] in [IN/OUT REC] menu.

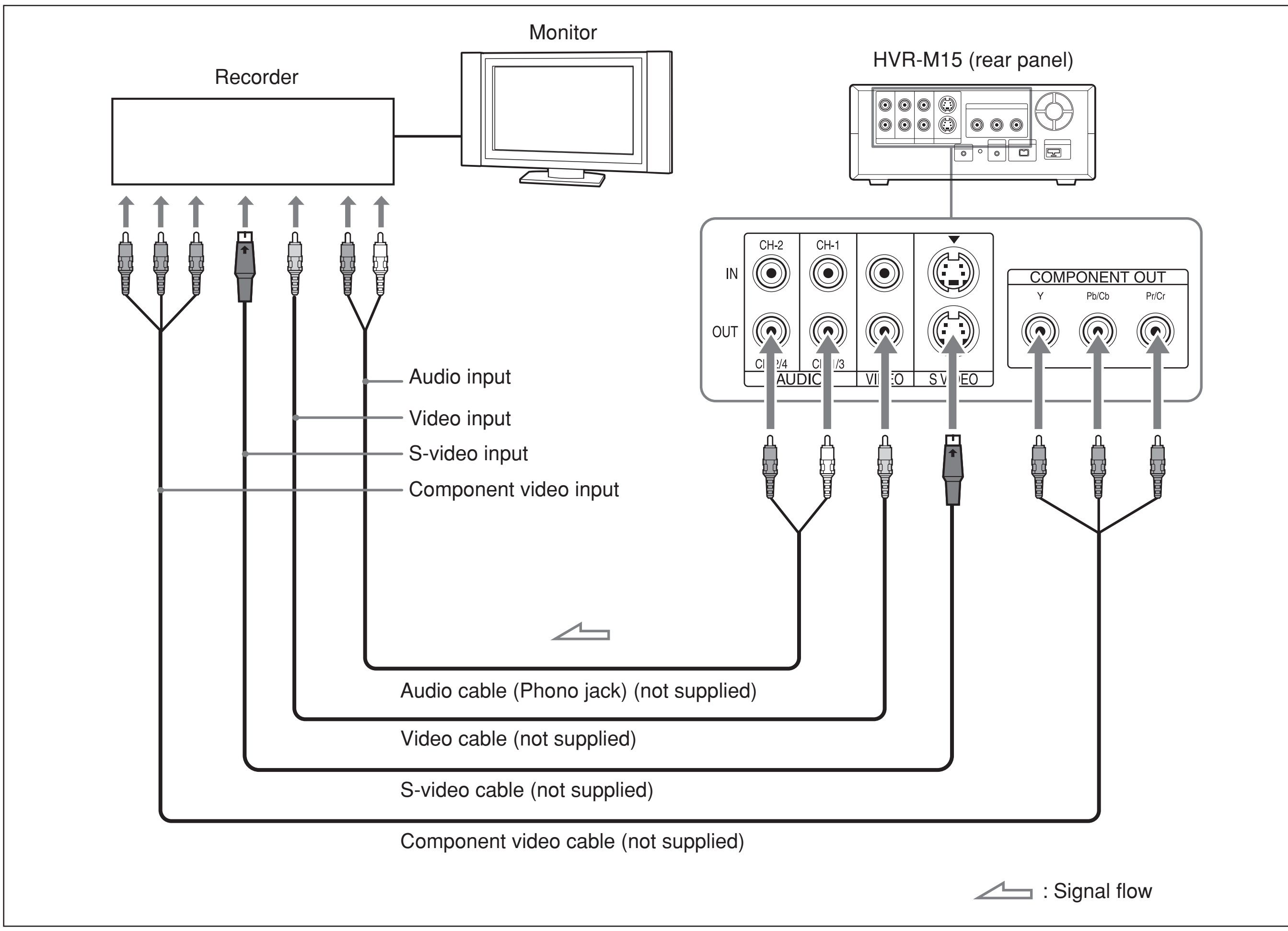
There are some limitations to down convert a tape recorded in HDV format to DVCAM format.
For details, see "i.LINK SET" on page 47.

Notes

- If you output pictures in the playback pause mode when connected with an i.LINK cable, recorded images may appear distorted.
- When the tape is recorded in HDV format, the picture is output as a simplified picture for Search in the playback pause mode or during playback in various speeds *(page 29)*.
- When connected with an i.LINK cable, you cannot output only pictures or sounds separately.
- For details on the compatibility of various formats, the supplied "Compatibility of HDV, DVCAM, and DV Formats" *(page 68 - 72)*.

To video equipment without an i.LINK jack

When connecting the unit to a recorder without an i.LINK jack, connect the two devices as shown below. Set [COMPONENT] and [DOWN CONVERT] setting of [VIDEO OUT] in [IN/OUT REC] menu *(page 47)* corresponded to the signals you wish to output.



Notes

- Refer also to the Notes on page 25.
- The audio output signal is selected by the setting of [AUDIO MIX] in [AUDIO SET] menu.

Dubbing to another equipment

Dubbing procedures

1 Prepare the unit.

Refer to "Settings for Recording" on page 34.

2 Prepare the recorder.

If the recorder has an input selector switch, select an input.
For details, refer to your recorder's instruction manual.

3 Start playback on the unit and start recording on the recorder.

For details, refer to your recorder's instruction manual.

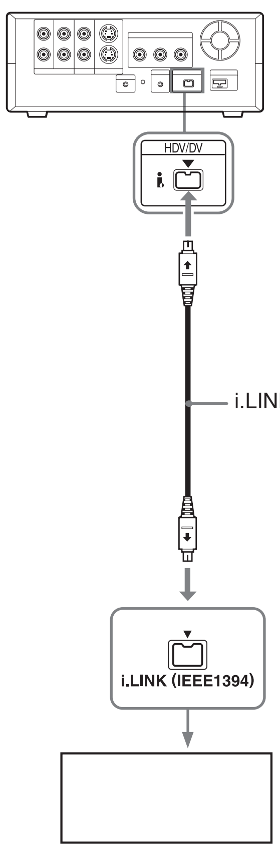
4 When dubbing is finished, stop recording on the recorder, and then stop playback of the unit.

Editing (Connecting with a Computer)

You can set up an editing system by connecting the unit to a computer (editing machine) using i HDV/DV jack on the unit.

- For details about the connecting method to the editing machine, refer to the supplied instruction manual of your editing unit.
- The editing functions you can use depend on the editing software. For details about editing methods, refer to the instruction manual of your editing software.

Connecting the Unit to a Computer



Notes

- Be sure to connect the i.LINK cable to a computer (editing machine) first and then connect it to the unit. If you connect the i.LINK cable to the unit first, it may cause the unit to malfunction because of static electricity.
- If no picture appears via i HDV/DV jack, disconnect the i.LINK cable, then reinsert it straight.
- If the unit is connected to a device equipped with a 6-pin i.LINK jack, when you intend to disconnect or reconnect the i.LINK cable, turn off the device and pull out the plug of its power cord from the wall outlet beforehand. If you connect or disconnect the i.LINK cable while the device is connected to the AC outlet, high-voltage current (8 to 40 V) is output from i.LINK jack of the device to the unit, which may cause a malfunction.
- Before connecting the i.LINK cable, set [HDV/DV SEL] and [i.LINK SET] in [IN/OUT REC] menu. If you perform the settings after connecting the cable, the computer (editing machine) may not recognize the unit correctly or may freeze.
- If you input or output signals in a format incompatible with the computer (editing machine), the computer may not recognize the unit correctly or may freeze.
- When set to EE mode, the unit outputs analog signals those are input from i HDV/DV jack to a computer. S Video or VIDEO signals are output from i HDV/DV jack, according to the setting of INPUT SELECT switch. To output the playback image from the unit through i HDV/DV jack only, set INPUT SELECT switch to HDV/DV.

Preparations

Transferring the picture data from the unit to a computer (editing machine)

- To transfer the picture data recorded on a tape to an editing machine in HDV, set [HDV/DV SEL] in [IN/OUT REC] menu to [HDV] *(page 46)*, then set [HDV→DV CONV] of [i.LINK SET] in [IN/OUT REC] menu to [OFF] *(page 47)*.
- To transfer the picture data recorded on a tape in DVCAM (DV) to an editing machine, set [HDV→DV CONV] of [i.LINK SET] in [IN/OUT REC] menu to [OFF] *(page 47)*.
- To transfer the picture data recorded on a tape in HDV to an editing machine in DVCAM (DV), select [DVCAM] or [DV SP] in [HDV → DV CONV] of [i.LINK SET] in [IN/OUT REC] menu, then set [DOWN CONVERT] *(page 47)*.

Notes

- The operation may not work with some of your editing machine software. Before using the software, confirm that it is compatible with the unit.
- The unit cannot up convert a tape recorded in DVCAM (DV) format to HDV format when transferring the picture data to an editing machine.
- If you mix a tape recorded both in HDV and DVCAM (DV) formats mixed when [HDV/DV SEL] is set to [AUTO], the computer (editing machine) may not recognize the unit or you may not edit the tape correctly.
- There are restrictions on the video output when you play back a tape recorded in HDV format at various speeds. Refer to the table for "HDV-formatted tape" in "Playing at various speeds" *(page 29)*.
- When you use a tape that was down converted from HDV to DVCAM or DV, some conventional DVCAM/DV editing software may not perform the time code search or this operation could result in an error.
- When you record HDV signals that are input through i HDV/DV jack, a connecting portion between scenes on the tape will be displayed as a still picture for approximately 1 second. We recommend you to perform digital nonlinear editing.
- If the editing software used has the capability to output the time code as well as the video and audio signals to the unit, and you intend to record that time code, set [HDV/DV IN TC] in [TC/UB SET] menu to [EXTERNAL].
  For details on [TC/UB SET] menu, see "TC/UB SET" menu on page 52.
- When [HDV/DV IN TC] in [TC/UB SET] menu is set to [EXTERNAL], if you input time code to the i HDV/DV jack that is not continuous or does not advance correctly, the value of the recorder or displayed time code may not be equal to the actual value of the input one. If you use a tape recorded under such condition, you may not perform search or edit the picture, depending on the device you use.
- For connection of the editing controller and its peripheral devices, refer to the instruction manual of the editing controller and that of the editing software you use.
- Edit functions are specified by the editing software. For details on the editing methods used, refer to the instruction manual of the editing software.
- The unit has a function to down convert HDV signals to DVCAM (DV) signals to output from i HDV/DV jack. Some software may not edit DVCAM/DV signals that are down converted from HDV signals correctly. In this case, follow the procedures below for tape duplication, then use the duplicated tape when editing the picture.

Creating a DVCAM compatible tape

Set [HDV → DV CONV] of [i.LINK SET] in [IN/OUT REC] menu to [DVCAM] (page 47), then perform DVCAM recording using a recording device that accepts DVCAM format.

Creating a general consumer DV compatible tape

Set [HDV → DV CONV] of [i.LINK SET] in [IN/OUT REC] menu to [DV SP] (page 47), then perform DV recording using a recording device that accepts DV format.

Transferring the picture data on a computer (editing machine) to the unit

- To transfer the picture data recorded on a tape to an editing machine in HDV, set [HDV/DV SEL] in [IN/OUT REC] menu to [HDV], then set [HDV → DV CONV] of [i.LINK SET] in [IN/OUT REC] menu to [OFF] *(pages 46, 47)*.
- To transfer the picture data to a computer (editing machine) in DVCAM (DV) format, set [HDV/DV SEL] to [DV] *(page 46)*. Then, according to the desired recording format, set [▭ REC MODE] to [DVCAM] or [DV SP] *(page 46)*. Also, according to your edit software, select [DVCAM] or [DV SP] in [HDV → DV CONV] of [i.LINK SET] in [IN/OUT REC] menu *(page 47)*.

Chapter 4

Adjusting and Setting Through Menus

Operating the Menus

The unit allows you to set various parameters in the menus. Before you start using the unit, set the internal clock in [CLOCK SET] in [OTHERS] menu. Except for clock setting, you can use all other factory-set default parameters but change them as needed.

Notes

- Do not pull out the power cord plug while operating the menus. Otherwise, the settings of the menu may be changed accidentally.
- If the internal backup battery is exhausted, the time set in the internal clock and [60i/50i SEL] setting will be initialized. The internal backup battery is fully charged if you connecting the power to the unit for about 24 hours. A fully charged internal battery can run for about 3 months.

Displaying the menu

1. Press MENU button.
2. Pressing ⇧/⇩ buttons, select the menu icon you want to change, then press EXEC button.
3. Pressing ⇧/⇩ buttons, select the submenu you want to change, then press EXEC button.
4. Pressing ⇧/⇩ buttons, change the setting.
5. Press EXEC button to return to the submenu.
6. Repeat steps **1** to **5**, as needed.

To return to the previous menu level, press ⇧/⇩ buttons and select [↩ RETURN].

You can use ⇦/⇨ buttons to move the menu cursor and to adjust increase/decrease settings.

Menu Organization

The menu of the unit consists of the following menus and submenus.

- **IN/OUT REC**
  - HDV/DV SEL *(page 46)*
  - REC MODE *(page 46)*
  - VIDEO OUT *(page 47)*
  - i.LINK SET *(page 47)*
  - COLOR BAR *(page 48)*
  - BARS TYPE *(page 48)*
  - DV BARS *(page 48)*
  - EE/PB SEL *(page 48)*
  - 480i LEVEL *(page 48)*
- **DISPLAY SET**
  - DATA CODE *(page 49)*
  - LETTER SIZE *(page 49)*
  - DATE DISPLAY *(page 49)*
  - TIME DISPLAY *(page 49)*
  - REMAINING *(page 49)*
- **AUDIO SET**
  - AUDIO MODE *(page 50)*
  - AUDIO AGC *(page 50)*
  - AUDIO REC LV *(page 50)*
  - AUDIO MIX *(page 50)*
  - AUDIO LOCK *(page 51)*
  - JOG AUDIO *(page 51)*
- **VTR SET**
  - AUTO REPEAT *(page 51)*
  - AUTO INDEX *(page 51)*
  - STILL PICT *(page 51)*
  - FF/REW SPEED *(page 51)*
  - STILL TIME *(page 52)*
  - FROM STILL *(page 52)*
  - FROM REC P *(page 52)*
- **TC/UB SET**
  - HDV/DV IN TC *(page 52)*
  - TC FORMAT *(page 53)**
  - TC RESET *(page 53)*
- **OTHERS**
  - LANGUAGE *(page 53)*
  - COMMANDER *(page 53)*
  - PB YNR *(page 54)*
  - PB CNR *(page 54)*
  - CLOCK SET *(page 54)*
  - HOURS METER *(page 54)*
  - AC ON MODE *(page 54)*
  - 60i/50i SEL *(page 55)*
  - INITIALIZE *(page 55)*

* available only when you use a 60i formatted signal

Menu Contents

Initial settings are indicated with rectangles.

IN/OUT REC menu

<table>
<tr><th>Icon/Menu</th><th>Submenu</th><th>Setting</th></tr>
<tr><td rowspan="2">IN/OUT REC</td><td>HDV/DV SEL
(pages 25, 33, 37, 41)</td><td>Normally, set this menu to [AUTO]. Select this menu when you want to limit the output format during tape playback or limit the signals to be input or output from HDV/DV jack. This setting will affect analog outputs.
AUTO: Automatically switches signals to HDV format or DVCAM/DV format during tape playback. When the i.LINK cable is connected, the signals in HDV format or DVCAM/DV format are switched automatically and signals from HDV/DV jack will be input/output for recording/playback.
HDV : Outputs portions of signals recorded in HDV format during tape playback. When the i.LINK cable is connected, only the signals in HDV format from HDV/DV jack are input/output for recording/playback. Also, select this setting when the unit is connected to the i.LINK cable to a computer supporting HDV format (see pages 25, 41).
DV : Outputs signals of portions recorded in DVCAM/DV format during tape playback.
When the i.LINK cable is connected, only the signals in DVCAM/DV format from HDV/DV jack are input or output for recording/playback. Also select this setting when the unit is connected to the i.LINK cable to a personal computer that supports DV format (see pages 25, 41).
Notes
• Before changing the setting, be sure to disconnect the i.LINK cable, or turn the other device off. If an i.LINK cable is connected when you change the setting, the video equipment may not be able to recognize the signal correctly.
• If you select [AUTO], the screen turns off temporarily when HDV signals are switched to DVCAM/DV signals or vice versa. The video and audio also stops at the same time.
• For details of the i.LINK output and the recording tape format, see page 71.</td></tr>
<tr><td>REC MODE</td><td>Switches the recording mode between DVCAM and DV format (SP mode only).
DVCAM : Records in DVCAM format.
DV SP : Records in DV format (SP mode).
Note
You cannot change the setting during recording.</td></tr>
</table>

Icon/Menu	Submenu	Setting
IN/OUT REC	VIDEO OUT	Selects the mode of video output jacks. **COMPONENT** Selects the output format from COMPONENT OUT jacks. Selects from [480i], [480p/480i] or [1080i/480i] when [60i/50i SEL] in [OTHERS] menu is set to 60i. Selects from [576i], [576p/576i] or [1080i/576i] when [60i/50i SEL] in [OTHERS] menu is set to 50i. **DOWN CONVERT** Selects the setting for down converting images output from analog video jacks when playing back in HDV format or inputting HDV signals from HDV/DV jack. **SQUEEZE**: Maintains the image vertically and horizontally by compressing the horizontal ratio. Images appear vertically long. **LETTER BOX** : Maintains the image vertically by compressing the vertical ratio. **EDGE CROP** : Maintains the original image size and crops the left and right edges of the images. **Notes** • When you play back an HDV-formatted tape with copyright protected signals, or input HDV format with copyright protected signals, COMPONENT OUT jacks will output pictures in either 480i or 576i format. • Regardless of the playback tape or of the format input to HDV/DV jacks, the selectable setting values displayed on this menu vary depending on the setting of [60i/50i SEL]. • WSS (Wide Screen Signaling) is not output, when the picture is output to COMPONENT OUT jacks in 480p or 576p. Set the monitor according to the down convert format of the picture, which is output from the unit. • When you play back a tape in DVCAM or DV while an EE picture in NTSC/PAL is displayed, the 480i resolution or the 576i resolution is output, regardless of the setting of [COMPONENT] in [VIDEO OUT] in [IN/OUT REC] menu.
	i.LINK SET *(pages 25, 37)*	Adjusts the down conversion format. This menu is available when [HDV/DV SEL] is set to [AUTO] or [HDV]. **HDV → DV CONV** **OFF**: Disables down conversion. **DVCAM** : Down converts to DVCAM format. **DV SP** : Down converts to DV SP format. **DOWN CONVERT** This setting is available when [HDV → DV CONV] is set to [DVCAM] or [DV SP]. **SQUEEZE**: Plays back with compressed horizontal screen image and maintains all images on display. Images appear vertically long. **EDGE CROP** : Plays back with both left and right sides of the screen images cut off and maintains the original image appearance. **Notes** • When [DVCAM] is selected, there are some limitations described below. – ATN (Absolute Track Number) outputs the value counted in DVCAM format during playback at regular speed (×1) or recording of the internal color bars only. During playback at irregular speeds other than described above, ATN outputs the value of a tape recorded in HDV format. – When the unit is playing back at regular speed (×1) while detecting a blank portion on the tape, the unit counts the blank portion as ATN formatted in DVCAM. – When using the duplicating function that is equipped with a device such as the DSR-25/45/50, select [DVCAM]. – Please note that a duplicated tape and the source tape recorded in HDV format with [DVCAM] selected do not share the same ATN (Time code value is displayed correctly). • When you change the video format setting of [DOWN CONVERT] of [i.LINK SET] in [IN/OUT REC] menu, the video signal output from COMPONENT OUT jacks, S VIDEO jack, or VIDEO OUT jack may be distorted for a moment. • Before changing your setting, be sure to disconnect the i.LINK cable. If you change the setting while i.LINK is connected, the video device may not recognize the new setting.

(Continued)

Operating the Menus

Icon/Menu	Submenu	Setting
IN/OUT REC	COLOR BAR	Selects whether to display color bars or not. Also, you may select color bars with or without tone signals (1 kHz full bit –20 dB at 60i, 1 kHz full bit –18 dB at 50i). **OFF**: Does not display color bars and no tone signals. **ON** : Displays color bars without tone signals. **ON [TONE]** : Displays color bars with tone signals. **Notes** • Color bars and tone signals are output from HDV/DV jack and analog output jacks. • Color bars and tone signals cannot be output when the tape is in playback mode. • The color bars output to i.LINK/the color bars recorded on tone signals and tapes/the format of tone signals can be set by [HDV/DV SEL] and [REC MODE]. – When [HDV/DV SEL] is set to [AUTO], the format of the color bar and tone signals will be output/recorded according to the video format displayed in "❶ Format indicator" *(page 18)* of text data display on a monitor. – When [HDV/DV SEL] is set to [HDV], color bars and tone signals are output/recorded in HDV format. – When [HDV/DV SEL] is set to [DV] and [REC MODE] is set to [DVCAM], color bars and tone signals will be output/recorded in DVCAM format. – When [HDV/DV SEL] is set to [DV] and [REC MODE] is set to [DV SP], color bars will be output/recorded in DV (SP) format. • When the unit turns off and on again, [COLOR BAR] is automatically set to [OFF].
	BARS TYPE	Selects the type of color bars. **TYPE 1**: Outputs TYPE 1 color bars. **TYPE 2** : Outputs TYPE 2 color bars. **TYPE 3** : Outputs TYPE 3 color bars. **Notes** • When color bars are output in NTSC (60i) mode on the unit, no-setup (0 IRE) signals are output. • Even when the unit's screen aspect ratio displays 4:3, the color bars are generated as 16:9. To output the edge crop (4:3) in HDV format, select [TYPE 1]. • Color bars on the unit are generated in HDV (1080i) resolution. When a resolution other than HDV (1080i) is output, the color bars are down converted and output. The transition edges between the color bars are distorted. • You cannot change the current setting during recording.
	DV BARS	Selects the aspect ratio of color bars set in [BARS TYPE] (DVCAM/DV (SP) format only). **16:9** : Sets the aspect ratio of color bars to 16:9. **4:3** : Sets the aspect ratio of color bars to 4:3. **Note** You cannot change the current setting during recording.
	EE/PB SEL	Sets the stop, fast-forward and rewind modes. **EE**: Outputs EE pictures and EE sounds. **PB**: Mutes the image and sound. **Note** Even [PB] is selected, when you press REC button: – EE pictures and EE sounds are output. – When [HDV/DV IN TC] in [TC/UB SET] menu is set to [EXTERNAL], and INPUT SELECT switch is set to HDV/DV, the time code of the other device connected to HDV/DV jack is displayed on Data display screen.
	480i LEVEL	Selects the component output level of luminance and chrominance from either BETACAM or SMPTE signals when the component output is 480i. **SMPTE**: Sets COMPONENT OUT jacks to SMPTE level. **BETACAM** : Sets COMPONENT OUT jacks to BETACAM level. **Note** For details on COMPONENT OUT jacks specifications, *see page 75.*

DISPLAY SET menu

Icon/Menu	Submenu	Setting
DISPLAY SET	DATA CODE *(page 28)*	Selects whether or not to display the data codes on the analog video output. **OFF** : Does not display the data codes. **DATE** : Displays the date and time when recorded. **CAMERA DATA** : Displays the camera data.
	LETTER SIZE	Selects the letter size of the menu at the cursor. **NORMAL** : Normal size **2×** : Double height size
	DATE DISPLAY	Selects the date display in the search screen, the data code display. **Y/M/D** : Displays YY/MM/DD (year/month/day). **M/D/Y** : Displays MM/DD/YY (month/day/year). **D/M/Y** : Displays DD/MM/YY (day/month/year).
	TIME DISPLAY	Selects the time display in the search screen, the data code display. **12H** : Displays 12-hour time. (If 60i system is the factory setting.) **24H** : Displays 24-hour time. (If 50i system is the factory setting.)
	REMAINING *(page 18)*	**AUTO** : The remaining tape time is displayed for 8 seconds under the following conditions: – If the remaining tape time is determined when you turn on power while a cassette is loaded in the unit. – When you press PLAY button. Always displays under the following conditions: – Fast forward, rewind – Fast forward during playback, rewind during playback **ON** : Always displays the remaining tape time.

AUDIO SET menu

Icon/Menu	Submenu	Setting
AUDIO SET	AUDIO MODE *(page 35)*	Selects the audio mode. **FS32K** : Switches the audio mode to 4-channel mode (12-bit mode). **FS48K** : Switches the audio mode to 2-channel mode (16-bit mode). (This setting records the sound in all audio ranges, providing a high-quality sound recording.) **Notes** • When signals are input from HDV/DV jack, the audio mode of the signals to be recorded is the same as that of the input signals. • Recording performs automatically in [FS48K] mode in HDV format. • You cannot change this setting during recording. • Noise may occur at the instant you switch the audio mode. • To dub audio using an audio dubbing device, select [FS32K].
	AUDIO AGC	Selects whether to adjust the [AUDIO REC LV] automatically or not. **ON**: Adjusts the audio recording level automatically. **OFF** : Adjusts the audio recording level manually. (Set the audio recording level with [AUDIO REC LV] *(pages 35, 50)*.) **Note** Even this switch is set to [ON], the setting is not effective against the volume which exceeds the dynamic range of the input amplifier. For details on the available volume levels, see the "Specifications" of the unit *(page 74)*.
	AUDIO REC LV	Adjusts the audio recording level for analog audio input (CH-1 and 2) while recording. **–6 db** : Decreases 6 dB from the original audio input level. **0 db**: Leaves the original audio input level. **+6 db** : Increases 6 dB from the original audio input level. **Notes** • This setting is available only when [AUDIO AGC] is set to [OFF]. • If the audio level exceeds 0 dB at maximum volume, sound distortion occurs. • For details on the maximum audio recording level input, *see "Specifications" on page 74.*
	AUDIO MIX	Selects the audio to be output from AUDIO jacks during the 4-channel mode. **CH1, CH2**: Outputs only channels 1 and 2 audio. **MIX** : Outputs the synthesized audio of channels 1 and 3, and channels 2 and 4. (Each signal level will be 50% (–6 db) of the original audio level.) **CH3, CH4** : Outputs only channels 3 and 4 audio only. **Notes** • You cannot set this menu for a tape recorded using the [FS48K] audio mode of [AUDIO MODE] menu. • You cannot set this menu during HDV recording/playback. • The audio level meter displays the audio level of the current setting in this menu.

Icon/Menu	Submenu	Setting
AUDIO SET	AUDIO LOCK	**UNLOCK MODE**: Records the sampling clocks of audio and video independently. This mode applies to a consumer DV tape. **LOCK MODE** : Synchronizes the sampling clocks of the audio and video for recording. This setting is effective for digital processing and performs a clean splice during the audio editing process. **Notes** • You can set this menu when recording in DV format (SP mode) only. • When recording in HDV or DVCAM format, the menu is set to [LOCK MODE]. • During the i.LINK input, the same setting as that of an input signal is selected regardless of this setting.
	JOG AUDIO *(page 30)*	Selects either to turn the sound output on or off when the tape is played at a speed other than normal (DVCAM/DV (SP) format only). **OFF**: Does not output the sound when playing a tape at a speed other than normal. **ON** : Outputs the sound when playing a tape at a speed other than normal. **Notes** • Even if you have set this item to ON, the sound may not be output or may be interrupted depending on the recording format or tape conditions. • The unit cannot output sound with a tape recorded in HDV format at a speed other than normal.

VTR SET menu

Icon/Menu	Submenu	Setting
VTR SET	AUTO REPEAT *(page 31)*	Selects whether to playback with automatic repeat or not. **OFF**: Disables playback with AUTO REPEAT. **ON** : Enables playback with AUTO REPEAT.
	AUTO INDEX *(page 36)*	Selects whether or not to mark an index signal automatically when the unit in the stop mode starts recording. **ON**: Marks an index signal at the beginning of the recording. **OFF** : Does not mark an index signal at the beginning of the recording.
	STILL PICT	Selects the image displayed in the still mode (DVCAM/DV (SP) format only). **AUTO**: Displays an optimized image according to the movement in the image. **FRAME** : Displays a frame image. **FIELD** : Displays a field image. **Notes** • If you select [FIELD], the image of 2nd field is displayed. • When a tape has been recorded in HDV format, a filed image is always displayed.
	FF/REW SPEED *(page 10)*	Selects the tape transport mode in fast-forward and rewind. **FF/REW**: Fast-forwards or rewinds the tape at maximum speed without displaying the picture. **SHUTTLEMAX** : Fast-forwards or rewinds the tape at maximum speed while displaying the picture. DVCAM NTSC: Approx. 14 times of normal speed PAL: Approx. 17 times of normal speed HDV/DV(SP) Approx. 24 times of normal speed

(Continued)

Icon/Menu	Submenu	Setting
VTR SET	STILL TIME	Selects the time to switch to the tape protection mode from the still mode. **30 sec**: 30 seconds **1 min** : 1 minute **2 min** : 2 minutes **3 min** : 3 minutes **Notes** • If the unit is left in playback pause mode for a long time, the tape or the video heads may be damaged or the video heads may become clogged. Select the shortest time possible. Particularly, when using a Mini-DV cassette that is longer than 60 minutes, select [30 SEC] or [1 MIN]. • When the setting is changed, the first tape protection mode change uses the time setting from before the settings were changed. From the second tape protection mode change, the new time setting is used.
	FROM STILL	Selects the tape protection mode to change the mode after the time set in [STILL TIME] is past **STOP**: Stops the tape. **STEP FORWARD** : Forwards one frame. **Note** If you play a tape recorded in HDV format with [STEP FORWARD] selected, the tape advances a few frames forward.
	FROM REC P	Selects the tape protection mode which the unit changes after the recording has been paused for more than 3 minutes. **STOP**: Stops the tape. **REC PAUSE** : Maintains the recording pause mode. **Note** When the recording pause mode continues for a long time after you select [REC PAUSE], the tape may be damaged or the video heads may be damaged or clogged. If there is no other reason to do this, select [STOP]. Particularly when you use a Mini-DV cassette that is longer than 60 minutes, select [STOP].

TC/UB SET menu

Icon/Menu	Submenu	Setting
TC/UB SET	HDV/DV IN TC	Selects whether to record internal time code or external time code while the unit records the signals input from HDV/DV jack. **INTERNAL** : Records the time code generated by the internal time code generator. (If no time code is recorded on the tape, the unit records time code from 00:00:00:00. If there is time code already recorded on the tape, the unit records continuous time code from this point.) **EXTERNAL**: Records the time code with video and audio signals input from HDV/DV jack. **Notes** • When this item is set to [EXTERNAL], INPUT SELECT switch on the front panel is set to HDV/DV, and no signal is input from HDV/DV jack, if you start recording, bars (—:—:—:—) are recorded as time code. At the point that inputting of a signal begins, the time code of that signal will be recorded. • If you set this item to [EXTERNAL] and the external time code input is discontinuous or does not advance correctly, recording or displaying the time code on the unit may not be done correctly. If there is a discontinuous time code on your recorded tape, you may not be able to edit or search correctly, depending on the device used to edit.

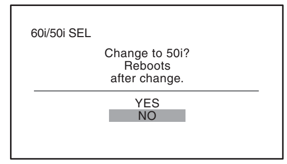
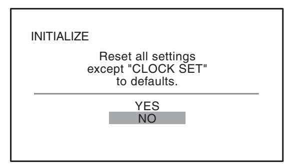
Icon/Menu	Submenu	Setting
TC/UB SET	TC FORMAT	Selects the recording mode of the time code when 60i is selected. **AUTO**: Automatically sets the mode in accordance with the mode already set on a cassette tape. (If nothing is recorded on the tape, the non-drop frame mode is set. If the unit cannot correctly read the frame mode on the tape, it will use the frame mode that was set in the last position on the tape that the unit can read correctly. If you remove the cassette, the mode of the last position that the unit was able to read correctly is cleared and the non-drop frame mode is set when recording is restarted from the same position.) **DF** : Selects the drop frame mode. **NDF** : Selects the non-drop frame mode. **Note** When [60i/50i SEL] is set to [50i], the unit operates as a 50i specification model. Therefore, the internal time code is set to the non-drop frame mode. Even if 60i signals are input to i HDV/DV jack when [60i/50i SEL] is set to [50i], the time code generated by the unit is in the non-drop frame mode regardless of [TC FORMAT] setting. To set the time code in the drop frame mode, set [60i/50i SEL] to [60i]. As a result, [TC FORMAT] setting will return to the status before [60i/50i SEL] was set to [50i].
	TC RESET	Reset the time code value to 00:00:00:00. **NO** : Does not reset the time code value. **YES** : Resets the time code value. **Note** This setting is available only when the unit in REC or REC PAUSE mode. Also, when INPUT SELECT switch is set to HDV/DV and [HDV/DV IN TC] is set to [EXTERNAL], this setting will not be affected and the time code will not be reset.

OTHERS menu

Icon/Menu	Submenu	Setting
OTHERS	LANGUAGE	You can select the desired language on Data display screen. You can choose Simplified English if your native language is not available among the options.
	COMMANDER *(page 16)*	Selects the control device. **WIRELESS** : Enables the control of Remote Commander. **CONTROL S** : Enables the control of the remote control unit DSRM-10 (not supplied) connected to CONTROL S IN jack. (Remote Commander is disabled.) **Notes** • The unit accepts signals from any Sony Remote Commander whose command mode is set to VTR4, not only the supplied one. To disable the control from any Remote Commander, set this item to [CONTROL S]. • You can also use the DSRM-20 (no longer manufactured: not supplied).

(Continued)

<table>
<tr><th>Icon/Menu</th><th>Submenu</th><th>Setting</th></tr>
<tr><td rowspan="5">OTHERS</td><td>PB YNR</td><td>Selects the noise reduction level for the luminance signals when a tape is played.
OFF: No noise reduction
LOW : Low noise reduction
HIGH : High noise reduction
Notes
• When you use noise reduction, there may be an afterimage depending on the condition of the picture.
• Noise reduction is also available with pictures output from HDV/DV jack. Use caution when dubbing and editing a picture in HDV/DV.</td></tr>
<tr><td>PB CNR</td><td>Selects the noise reduction level for the chrominance signals when a tape is played.
OFF: No noise reduction
LOW : Low noise reduction
HIGH : High noise reduction
Notes
• When you use noise reduction, there may be an afterimage depending on the condition of the picture.
• Noise reduction is also available with pictures output from HDV/DV jack. Use caution when dubbing and editing a picture in HDV/DV.</td></tr>
<tr><td>CLOCK SET</td><td>1 Press ⇧/⇩ buttons to adjust the number, then press ⇦/⇨ buttons to set the month, day, hour, and minute.
2 Press EXEC button to execute.
Notes
• 12:00 AM stands for midnight and 12:00PM stands for noon when [TIME DISPLAY] is set to [12H].
• If you do not use the unit for 3 months or more, the built-in rechargeable battery will become completely discharged, and the settings of the day and the time may be cleared from the memory. In this case, charge the built-in rechargeable battery and set the clock again (page 67).</td></tr>
<tr><td>HOURS METER</td><td>Displays the accumulated time counts (by the digital hours meter) in units of 10 hours or 10 counts.
OPERATION : Power on duration
DRUM RUN : Drum rotation duration
TAPE RUN : Tape run duration
THREADING : Tape unthreading count</td></tr>
<tr><td>AC ON MODE</td><td>Switches the state into which the unit goes when the unit is connected to the AC outlet.
STANDBY: Makes the unit go into the standby mode.
ON : Turns the unit on.</td></tr>
</table>

Icon/Menu	Submenu	Setting
OTHERS	60i/50i SEL *(page 34)*	Switches to the 1080/60i (NTSC) or the 1080/50i (PAL). **1** Press ⇧/⇩ buttons to select [YES], then press EXEC button.  **2** Press ⇧/⇩ buttons to select [YES] again, then press EXEC button.
	INITIALIZE	Resets the menu to factory settings except CLOCK SET. **1** Press ⇧/⇩ buttons to select [YES], then press EXEC button.  **2** Press ⇧/⇩ buttons to select [YES] again, then press EXEC button.

Chapter 5

Maintenance

Troubleshooting

Please check the following before contacting your Sony dealer.

General Operation Troubles

Symptom	Cause/Remedy
A menu item is not available.	• There are menus that cannot be used depending on the setting in [IN/OUT REC] menu. → Change [IN/OUT REC] menu settings *(page 46)*. • Some menu items are only available in EE mode or playback mode. → Set the unit to EE mode or playback mode. • Some menu items are only available when the tape is inactive. • There are some menus you cannot use without setting the clock. • Some menu items are not available when REC/SAVE switch on the cassette inside the unit has been set to SAVE. → Set the switch to REC.
Some menu item settings change accidentally.	• You have pulled out the power cord during a menu operation. → Adjust the menu again. To prevent this incident recurring, do not pull out the plug while adjusting the menu.
The unit operates by itself.	• [COMMANDER] in [OTHERS] menu is set to [WIRELESS] and a Sony Remote Commander whose command mode is set to VTR4 is operated near the unit. → Set [COMMANDER] to [CONTROL S].
The supplied wireless Remote Commander does not work.	→ Set [COMMANDER] in [OTHERS] menu to [WIRELESS].
Even though the settings on the unit are correct, you cannot make the unit record using the Remote Control Unit DSRM-10 (not supplied).	• On the Remote Control Unit DSRM-10, press PLAY button while holding REC button down.
Whenever you connect the unit to an AC outlet or the AC adaptor, the unit turns on automatically.	• [AC ON MODE] in [OTHERS] menu is set to [ON]. → Set [AC ON MODE] to [STANDBY]. • There is a cassette inside the unit and [AUTO REPEAT] in [VTR SET] menu is set to [ON]. → Set [AUTO REPEAT] to [OFF].

Power sources

Symptom	Cause/Remedy
The power cannot be turned on.	• The power cord of the AC adaptor is disconnected. → Connect the AC power cord.
The unit does not operate even if the power has been turned on.	• Moisture condensation has occurred *(page 66)*. • The cassette is not inserted straight. → Eject and reinsert it straight. → Disconnect the power supply and then reconnect it after about 1 minute. If the unit does not operate even after you reconnect the power, use a sharp-tipped ballpoint pen or similar tool to press RESET button. When you press RESET button, all settings including the date and time and [60i/50i SEL] will be initialized.
The unit does not operate properly when the AC adaptor is used.	→ Turn off the power and remove the power cord from the AC outlet and then reconnect the power cord.

Cassette tapes

Symptom	Cause/Remedy
The cassette cannot be inserted.	• There is moisture condensation on the head drum *(page 66)*. → With the unit powered on, wait more than one hour. • The cassette is not inserted straight. → Eject and reinsert it straight. • Another cassette has been loaded already. → Remove the cassette and insert the one you want to load.
It takes time to eject the cassette.	• This is not a malfunction. → The unit ejects the cassette slowly to protect the tape. While the cassette is being ejected, (cassette) indicator blinks.
A cassette tape cannot be removed.	→ Check whether the power supply is connected properly.
The cassette tape is not ejected when you press EJECT button.	• Moisture condensation has occurred in the unit *(page 66)*.
The cassette memory data and title are not displayed when using a cassette tape with the cassette memory function.	• The unit does not support the cassette memory function and therefore such data is not displayed.
The remaining tape time is not displayed.	→ To always display the remaining tape time, set [REMAINING] in [DISPLAY SET] menu to [ON].

Output/Playback

Symptom	Cause/Remedy
Cannot playback.	→ If a tape has reached its end, rewind the tape.
Cannot playback in reverse at various speeds.	• The unit cannot play back a tape recorded in HDV format in the reverse direction at various speeds *(page 29)*.
Horizontal lines are displayed on an image. An image has block noise. An image is blurred or not displayed.	• The video heads are dirty. → Clean the video heads using the supplied cleaning cassette. • A damaged tape is loaded. → Remove the cassette and insert another one. • You have tried to make the unit play back a tape recorded in LP mode of DV format. → The unit can play back only tapes recorded in HDV, DVCAM or DV (SP) format. A tape recorded in LP mode of DV format cannot be played back on the unit.
No picture is output from HDV/DV jack.	→ Reconnect the i.LINK cable (not supplied). • INPUT SELECT switch is set to a position other than HDV/DV. → Set the switch to HDV/DV. → Set [HDV/DV SEL] in [IN/OUT REC] menu correctly.
The audio breaks up.	• A damaged tape is loaded. → Remove the cassette and insert another one. • The video heads are dirty. → Clean the video heads using the supplied cleaning cassette. • You have tried to make the unit play back a tape recorded in LP mode of DV format. → The unit can play back only tapes recorded in HDV, DVCAM, or DV (SP) format. A tape recorded in LP mode of DV format cannot be played back on the unit.
Cannot perform a date search and index search.	• There is a portion with no recording at the beginning or in the middle of a tape. This is not a malfunction.
The time code is not reset to "00:00:00:00" after rewinding a tape to the recording starting point.	→ The time code is not displayed correctly at the starting point of recording. This condition, however, is not a malfunction. When you restart playback, the time code and images are displayed correctly from the starting point.
"–– –– ––" appears *(page 28)*.	• The tape has been played back without setting the date and time. → Set the date and time. • The tape portion being played back has no recording. • If there is a scratch or noise on the tape, the data code cannot be read.
Although the component video cable is connected properly to a television set or monitor to play back a tape, no image or audio is output.	→ Use the correct setting for [COMPONENT] of [VIDEO OUT] in [IN/OUT REC] menu in accordance with the equipment to be connected. • No audio is output from COMPONENT OUT jacks. → Connect also an audio cable.
When you connect the unit to a 4:3 television set, the displayed image appears flattened.	→ When you output from COMPONENT OUT jacks, set [COMPONENT] and [DOWN CONVERT] of [VIDEO OUT] in [IN/OUT REC] menu correctly before play back. When you output from HDV/DV jack, set [HDV → DV CONV] and [DOWN CONVERT] of [i.LINK SET] in [IN/OUT REC] menu correctly before play back. When you output from S VIDEO jack and VIDEO jack, set [DOWN CONVERT] of [VIDEO OUT] in [IN/OUT REC] menu correctly before playback. → DVCAM/DV tape images recorded in the wide mode are not displayed properly. Use a widescreen-compatible monitor.

Symptom	Cause/Remedy
Even though [HDV/DV IN TC] in [TC/UB SET] menu is set to [EXTERNAL], the time code of the input i.LINK signal is not recorded.	• i.LINK signal output from the digital non-linear editing controller does not include a time code. → Confirm that the editing software you are using is capable of outputting a time code. • INPUT SELECT switch is not set to HDV/DV. → Set INPUT SELECT switch to HDV/DV.
After playing at 1/10 of normal speed in forward or reverse for more than 1 minute, normal playback forward starts.	→ To protect a tape, the unit is set to start normal playback after playing at 1/10 of normal speed in forward or reverse for more than 1 minute. Play back the tape at 1/3 of normal speed in forward or reverse.
Playback pause mode is released and the unit goes into the stop mode.	→ To protect the tape, the unit is set to go into the stop mode after the playback pause mode continues for a certain period. Set [FROM STILL] in [VTR SET] menu to [STEP FORWARD]. If you do so, the tape will forward for time of interval set in [STILL TIME].
Playback pause mode is released and the tape forwards by one frame for each preset time interval.	→ To protect the tape, the unit is set to forward the tape by one frame after the playback pause mode continues for a certain period. Set [FROM STILL] in [VTR SET] menu to [STOP]. If you do so, the unit will go into the stop mode after the playback pause mode continues for the interval set in [STILL TIME].
The pause mode of recording is released automatically.	→ To protect the tape and the video heads, the unit goes into the stop mode after the pause mode of recording, audio dubbing, or duplicating continues for more than about 3 minutes. To avoid the stop mode, set [FROM REC P] in [VTR SET] menu to [REC PAUSE] *(page 52)*.
When the tape is rewound to its beginning, the playback automatically starts.	• [AUTO REPEAT] in [VTR SET] menu is set to [ON]. → Set [AUTO REPEAT] to [OFF]. • You pressed PLAY button while holding REW button down. → If you do this, the unit rewinds the tape to its beginning and begins playback *(page 11)*.
During playback, the unit starts rewinding suddenly.	• [AUTO REPEAT] in [VTR SET] menu is set to [ON]. → When [AUTO REPEAT] is set to [ON], the unit starts rewinding at the moment when a signal for index search or a blank portion is detected. Set [AUTO REPEAT] to [OFF].
When the tape reaches its end, rewinding starts automatically.	• [AUTO REPEAT] in [VTR SET] menu is set to [ON]. → When [AUTO REPEAT] is set to [ON], the unit starts rewinding at the moment when the end of the tape is detected. Set [AUTO REPEAT] to [OFF].
No sound or undesired sound is output from AUDIO OUT jacks.	• When the audio mode is 32 kHz (4-channel), you can select the audio channel. Set [AUDIO MIX] in [AUDIO SET] menu according to the desired channel.
The unit starts recording/playback by itself without commands.	• [AUTO REPEAT] in [VTR SET] menu is set to [ON]. → Set [AUTO REPEAT] to [OFF]. • When [COMMANDER] in [OTHERS] menu is set to [WIRELESS], the unit responds to signals from Remote Commander. → Set [COMMANDER] to [CONTROL S].

(Continued)

Troubleshooting

Symptom	Cause/Remedy
The unit does not function as part of a digital non-linear editing system.	• INPUT SELECT switch is set to a setting other than HDV/DV. → Set it to HDV/DV. • The editing controller or the editing software is not compatible with the unit. → Refer to the instruction manuals of the controller or the software and consult their manufacturers.
Although the i.LINK cable is connected, the image from an external equipment is not displayed.	• Disconnect and then reconnect the i.LINK cable correctly. • INPUT SELECT switch is set to a setting other than HDV/DV. → Set it to HDV/DV.
No image is displayed even though the video cable is connected correctly.	• There are output restrictions for some [COMPONENT] settings of [VIDEO OUT] in [IN/OUT REC] menu. For details of [COMPONENT], *see pages14, 47*. • INPUT SELECT switch setting does not match the cable connected to the unit. → Set INPUT SELECT switch to S VIDEO or VIDEO to match the cable connection.
The image loses color or is distorted when you play back the tape on a television set or monitor connected to the unit.	→ Connect the unit to a television set or monitor that is compatible with its [60i/50i SEL] format. → Set [60i/50i SEL] in [OTHERS] menu, according to the signal-format *(page 55)*.
2/2-ST is displayed on the screen.	• This icon is displayed when you playback a tape recorded with 4-channel microphone recording on another device. This unit does not support 4-channel microphone recording. (The icon is displayed when you play back a tape recorded with 4-channel microphone in DVCAM or DV (SP) format. However, it is not displayed during playback of a tape recorded with 4-channel microphone in HDV format.)

Recording

Symptom	Cause/Remedy
No picture is output via i HDV/DV jack.	→ Reconnect the i.LINK cable (not supplied). • INPUT SELECT switch is set to a position other than HDV/DV. → Set the switch to HDV/DV. → Set [HDV/DV SEL] in [IN/OUT REC] menu correctly.
About the audio level setting: • You do not know how to adjust the input level. • The recorded level is too low. • The recorded sound is distorted.	Confirm the level of the sound output from the player by referring to the player's instruction manual. If you are not clear about the player's output level, try the following procedures. • Set [AUDIO AGC] in [AUDIO SET] menu to [OFF], set [AUDIO REC LV] to [0 dB], and play back the tape which you intend to use for playback. When the playback audio level is at its maximum, if the audio levels meters exceed 0 dB, set [AUDIO REC LV] to [–6 dB]. When the volume is too low, set [AUDIO REC LV] to [+6 dB]. The recorded sound at the portion where the meters exceed 0 dB will be distorted. For details of the acceptable maximum input level, *see page 50.*
No sound or undesired sound is output from AUDIO jacks in OUTPUT.	→ When the audio mode is 32 kHz (4-channel), set [AUDIO MIX] in [AUDIO SET] menu to [CH1, CH2]. When the audio mode is 32 kHz (4-channel) on the unit, audio is recorded in channel 1/2.
If an i.LINK cable is connected when you editing, the monitor does not display any image.	→ Use the correct setting for [HDV/DV SEL] in [IN/OUT REC] menu in accordance with the equipment to be connected.
EE sound is not output.	→ If the audio mode is set to 32 kHz (4-channel), Set [AUDIO MIX] to [CH1, CH2] or [MIX].
EE picture and EE sound are not output.	• [EE/PB SEL] in [IN/OUT REC] menu is set to [PB]. → Set [EE/PB SEL] to [EE]. • The setting of INPUT SELECT switch does not match the signal input. → Set the switch according to the signal input. • With an analog connection, the current setting of [60i/50i SEL] in [OTHERS] menu is not appropriate. → Set it to the appropriate position for the device you are using.

Warning indicators and messages

Self-diagnosis display/Warning Indicators

The following alarm indicators may appear on an external monitor. For further information about each symptom and recovery method, see the relevant page indicated in the parentheses.

Message/Alarm Indicator	Cause/Corrective Action
C:□□:□□/E: □□:□□ (Self-diagnosis display)	If an error still recurs after you retry the corrective actions several times, contact Sony Customer Service or your place of purchase. **C:21:□□** → Condensation has occurred. Remove the cassette and insert it again after approximately 1 hour *(page 66)*. **C:22:□□** → The video head is dirty. Use a cleaning cassette to clean the head *(page 64)*. **C:31:□□/C:32:□□** → Symptoms other than the above are occurring. Insert a cassette again and retry the operation. Do not take this action, however, if there is negligible condensation in the unit *(page 66)*. → Unplug the power cord, plug it in again, and then retry the operation. → Replace the tape.
(Moisture condensation warning)*	→ Remove the cassette, unplug the power cord, and leave the unit for approximately 1 hour with Cassette Lid left open *(page 66)*.
(Warning indicator pertaining to the tape)	**The icon blinks slowly.** • The remaining tape time is less than 5 minutes.
⏏ (Eject cassette warning)*	**The icon blinks rapidly.** • Condensation has occurred *(page 66)*. • The self-diagnostics message is displayed *(page 62)*.

* CAUTION indicator will blink when an alarm indicator or message is displayed *(page 11)*.

Alarm Messages

The following alarm messages appear with the alarm indicators. Take appropriate action according to the displayed message.

Item	Message	Cause/Corrective Action
Moisture condensation	Moisture condensation. Eject the cassette.	→ *See page 66 for details.*
	Moisture condensation. Turn off for 1H.	→ *See page 66 for details.*
Cassette/Tape	Insert a cassette.	→ *See page 21.*
	Reinsert the cassette.	• Check for damage on a tape or other irregularities.
	The tape is locked -check the tab.	→ *See page 20.*
	The tape has reached the end.	—
Others	Cannot record due to copyright protection.	—
	Change to correct tape format.	• This is an unsupported format and cannot be played back.
	No output image in “HDV/DV SEL”. Change format.	Stop playback or signal input, or change [HDV/DV SEL] setting *(page 46)*.
	Dirty video head. Use a cleaning cassette.	→ *See page 64.*
	Unplug power cable.	—
	Reinsert the cassette.	—
	Invalid input signal.	The signal that has been input to the unit is invalid. Check the input signal.
	Power voltage error.	—

Notes on Use

Notes on the Videocassette Recorder

Do not use the unit in a place subject to direct sunlight or heat sources

If you do, its cabinet, mechanical parts, etc., may be damaged.

Do not place the unit in humid places

Do not place the unit in places where they may be exposed to water-splash or to humidity. Do not place water-filled containers or vases on the unit. Doing so may cause the unit malfunction.

Do not use the unit in an extremely hot place

If the unit is left in a car parked with the windows closed (especially in summer), its cabinet, mechanical parts, etc., may be damaged or it may not work correctly.

If the unit is brought directly from a cold to a warm location

Moisture may condense inside the unit and cause damage to the video heads and tape. If you use the unit in a place subject to direct cold currents from an air conditioner, moisture may also condense inside the unit.

Do not place a heavy object on the unit

The cabinet, mechanical parts, etc., may be damaged, or the unit may not work correctly.

Do not handle the unit roughly

Avoid rough handling or mechanical shock to the unit.

To avoid damaging the cabinet's finish

Plastic is often used for the surface finishing of the unit. Do not spray a volatile solvent such as an insecticide toward the cabinet or place rubber or vinyl products on the cabinet for a long time. If you do, the finish of the cabinet may be damaged or the coating may come off.

Do not clean the cabinet with thinner or benzine

The cabinet may be damaged or its coating may come off. When you use a chemical-impregnated cloth, use it according to its directions.

Clean the cabinet with a soft dry cloth

When the cabinet is very dirty, clean it with a soft dry cloth lightly moistened with a mild detergent solution and finish it with a dry cloth.

Do not put magnetic objects close to the unit

Magnetic fields may damage the recording.

To prevent electromagnetic interference caused by radio communication equipment such as cellular phones, transceivers, etc.

The use of the radio communication equipment such as cellular phones or transceivers near the unit may cause a malfunction and can affect the audio/video signals. Cellular phones or transceivers near the unit should be switched off.

Do not use the unit in an area exposed to radiation

A malfunction may occur.

Checking the video heads every 1000 hours

A VCR is a high-precision piece of equipment that records and plays back the picture recorded on a magnetic tape. In particular, the video heads and other mechanical parts may become dirty or worn. To maintain a clean picture, we recommend maintenance every 1000 hours, even though the conditions of use may differ depending on temperature, humidity, dust, etc.

About connecting other equipment

When you connect the unit to another equipment or a computer using an i.LINK cable, confirm the direction of the jack. If you forcibly insert the jack, the terminal may be damaged or cause the unit to malfunction.

Cleaning of the Video Heads

With clogged video heads, the unit cannot record properly. Clean the video heads to prevent noise on the recorded picture or audio. For cleaning, use the supplied cleaning cassette.

Before recording an important event

The unit cannot record properly with the clogged video heads. To ensure normal recording and clear pictures and sound, clean the video heads before recording an important event.

Every 50 hours

If you repeat the tape transport operation, the video heads will become dirty and coated with fine dirt or dust. Clean the heads every 50 hours.

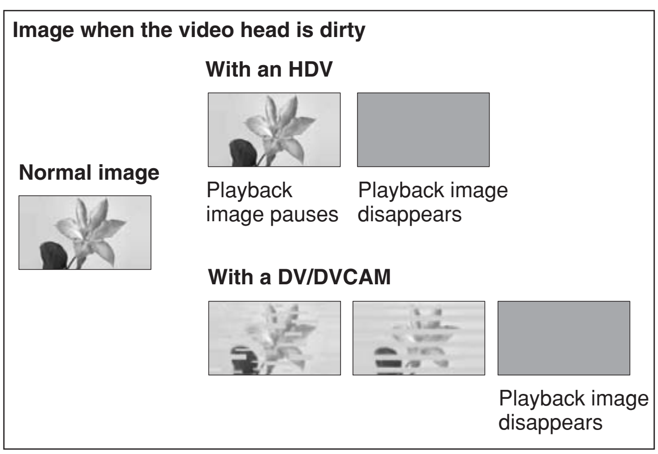
After using a tape prone to clog the heads

After using such a tape causes the symptoms illustrated below, clean the heads.

When the symptoms caused by clogged video heads appear

Even if you clean the heads periodically, clogging of the heads may occur anyway. Clean the heads when:

- mosaic-pattern noise appears on the playback picture.
- the playback picture freezes.
- a part of the playback picture does not move.
- playback pictures do not appear.
- playback audio is interrupted.
- “Dirty video head. Use a cleaning cassette.” will appear during recording.



To use the cleaning cassette

Clean the video head by playing the cleaning cassette for ten seconds.

* If the playback image continues to be stationary or any of the symptoms on the above remain even after cleaning with the cleaning cassette, there may be a problem with the tape. <u>Avoid using that tape.</u>

For details, refer to your cleaning cassette’s instruction manual.

Note

Using the unit as below will make the video head dirty.

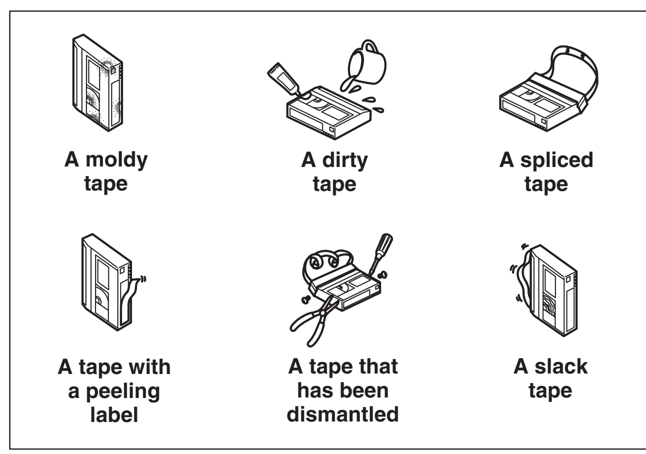
– Subjecting the unit to temperature change or high humidity.
  → Condensation occurs. *See page 66.*
– Using a damaged tape.
– Using the unit for a long time.
– Using the unit where there is a lot of dirt, dust or sand.
– Leaving a tape in the unit for a long time.

Cleaning cassettes are replaceable. After using the supplied cleaning cassette for the specified number of times, buy a cleaning cassette for replacement.

After prolonged use, the video heads may become worn out. If optimum picture quality is not restored even after you have cleaned the video heads with the cleaning cassette, the video heads may have worn out. In that case, you have to replace the video heads with new ones. Please consult your Sony dealer.

Notes on the Video Cassettes

Note that using a tape such as those below can damage the unit.



Using cassettes

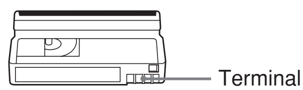
- <u>When using a cassette for the first time we recommend that you run the tape for about five seconds before recording.</u>
- When using a cassette that has been stored for a long time we recommend that you fast-forward and rewind it for some time. This will correct any winding irregularity in the cassette.
- Do not repeatedly insert and remove a cassette without running it. The tape may become slacked or damaged.

(Continued)

Notes on Use

Cleaning the terminal

If the gold-plated terminals of a cassette become dirty, or dirt accumulates on the terminals, the correct remaining tape time may not be displayed.
Clean the terminal with a swab once every ten times you eject a cassette.



When affixing a label to the cassette

Be sure to affix a label only on the correct location so as not to cause malfunction of the unit.

Storing cassettes

- After using the tape rewind it, put it in its case and store vertically. (To prevent picture and sound distortion.)
- Do not store tapes in the following places:
  – Where the temperature gets high (in strong sunshine, inside a car or near a heater)
  – Where there is high humidity
  – In a strong magnetic field (near a TV or speakers)

About Moisture Condensation

If the unit or cassette is brought directly from a cold to a warm location, moisture may condense inside or outside the unit or tape. If you use the tape or video heads in this condition, the tape may adhere to the head drum, and the video heads or the tape may be damaged, or a malfunction may occur.
When condensation occurs, the alarm messages "💧 ⏏ Moisture condensation. Eject the cassette" or "💧 Moisture condensation. Turn off for 1H." will appear.
Moisture condensation is likely to occur under the following conditions:

- The unit or cassette is brought from the cold outdoors to a warm indoor location.
- The unit or cassette is brought from the air-conditioned indoors to the hot outdoors.
- The unit is used in a place subject to cold currents from an air conditioner.

When bringing the unit or cassette from a cold place to a warm place or vice versa, put it in a plastic bag and seal the bag tightly. After bringing it into the new place, leave the bag on for more than one hour, and remove the bag when the air temperature inside it has reached the temperature surrounding it.

If moisture condensation occurred

If moisture condensation occurs, remove the cassette immediately. While the alarm indicator is displayed, you cannot operate the unit except to press EJECT button.
Turn off the power and leave Cassette Lid open until the condensation disappears (approximately 1 hour). If the alarm message does not appear when you turn on the unit, and if 💧 or ⏏ does not blink when you insert a cassette and press the video operation button, you can use the unit again.
If there is negligible condensation in the unit, this condensation may not be detected. In that case, the cassette may not be ejected for approximately 10 seconds. This is not a malfunction. Do not close Cassette Lid until the cassette is ejected.

Digital Hours Meter

The digital hours meter keeps cumulative counts of the total operation time, the head drum rotation time, the tape running time and the number of unthreading operations. These counts can be displayed on the menu. Use them as guidelines for scheduling maintenance.
In general, consult your Sony dealer about necessary periodic maintenance checks.

The digital hours meter has the following four display modes and you can check them in [HOURS METER] of [OTHERS] menu *(page 54)*.

- **OPERATION mode**
  The cumulative total hours of operating time is displayed in 10-hour increments.

- **DRUM RUN mode**
  The cumulative total hours of drum rotation with tape threaded is displayed in 10-hour increments.

- **TAPE RUN mode**
  The cumulative total hours of tape running time is displayed in 10-hour increments.

- **THREADING mode**
  The cumulative number of tape unthreading operations is displayed in 10-operation increments.

About the Built-in Rechargeable Battery

The unit is provided with a rechargeable battery that retains the date/time and various settings regardless of power-on and power-off. The rechargeable battery is charged as long as the unit is operated. If the period of operating the unit is short, the battery discharges gradually and if it is not used at all for approximately 3 months, the battery will discharge completely. If that case, charge the battery and then start using the unit.
If you do not need to record the date and time when the rechargeable battery is not fully charged, you can use the unit in this state.

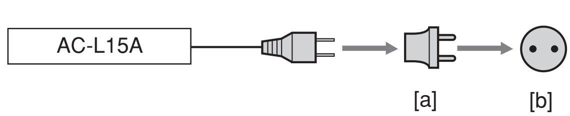
Charging the rechargeable battery

Connect the unit to an AC output using the AC adaptor and power cord. (The unit does not need to be turned on.)

Using your Videocassette Recorder abroad

You can use your Videocassette Recorder in any country/region using the AC adaptor.
Supplied within 100 V to 240 V AC, 50/60 Hz.

Use a commercially available AC plug adaptor [a], if necessary, depending on the design of the wall outlet [b].



Notes on the License

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Appendix

Compatibility of HDV, DVCAM, and DV Formats

HDV format is an HD VCR format based on DV format of the globally widespread general consumer digital VCR system. This format has the newly defined data recording specifications for HD signals compressed by MPEG2. It applies the same cassette, tape speed, and track pitch as DV format. The differences, compatibility, and restrictions in editing of HDV1080i, DVCAM, and DV formats are explained below.

Main differences between HDV1080i, DVCAM, and DV Formats

(The unit and other equipment for professional use may be functionally extended. For details, see the notes below the table.)

Specification	HDV1080i	DVCAM	DV (SP)
Track pitch	10 µm	15 µm	10 µm
Audio sampling frequency	16 bit: 48 kHz	12 bit: 32 kHz 16 bit: 48 kHz	12 bit: 32 kHz 16 bit: 32 kHz, 44.1 kHz, 48 kHz 2)
Audio recording mode 1)	Lock mode	Lock mode	Unlock mode 3)
Time code	Drop frame mode (60i only) 4) No user bits 5)	NTSC: SMPTE time code (DF/NDF, including user bits) PAL: EBU time code (including user bits) 5)	Drop frame mode (NTSC only) 4) No user bits 5)

1) There are two modes for audio signal recording: Lock mode and Unlock mode. In Lock mode, the sampling frequencies of audio and video are synchronized. In Unlock mode, adopted by the consumer DV format, the two sampling frequencies are independent. Lock mode maintains high compatibility with higher formats and offers better digital processing and smooth transition than Unlock mode when you edit audio.
2) The unit cannot record in DV format with 16 bit: 32 kHz or 44.1 kHz.
3) The unit has been functionally extended with a function for switching between Lock mode and Unlock mode.
4) The unit has been functionally extended with a function to enable DF/NDF setting for 60i with HDV or DV (SP) format.
5) The unit does not have user bit settings. (There are some devices which you can adjust the user bit settings.)

Playback compatibility

The compatibility between playback tape format and player is summarized in the table below.

Player / Playback tape format	DV format model	DVCAM format model	HDV1080i format model (the unit)
DV	Playback is possible. (Some equipment cannot play a tape recorded in LP mode.)	Only playback of a tape recorded in SP mode is possible. Some equipment can play a tape recorded in LP mode.	Only playback of a tape recorded in SP mode is possible. Some equipment can play a tape recorded in LP mode. (The unit can play back a DV-formatted tape in SP mode only.)
DVCAM	Playback may be possible on some models.	Playback is possible.	Playback is possible.
HDV	No playback is possible.	No playback is possible.	Playback is possible *

* The unit can play back for HDV720/30p format, but you cannot output the video signals from i HDV/DV jack.
The unit cannot play back other than HDV1080/60i, HDV1080/50i, such as HDV1080/30F, HDV1080/25F, HDV1080/24F, HDV720/25p, and HDV720/24p format. The unit cannot input/output, record, or play back extended HDV format signals with 4-channel audio mode.

Cassette compatibility

A tape with DV or miniDV mark can be used for HDV. The recording bit rate and recording track pitch on a tape of the HDV1080i system used for the unit are about 25 Mbps and 10 µm, respectively. The specifications are the same as that of home use DV (SP) tapes. The recording time on an HDV tape is also the same as that of DV (SP). The track pitch of DVCAM is 15 µm, which is 1.5 times of HDV/DV (SP). Therefore, the recording time using DVCAM recording on a same tape will be two-thirds of the time available when HDV/DV (SP) recording is used.

Compatibility of HDV, DVCAM, and DV Formats

Dubbing with S VIDEO or VIDEO jacks

When you use the unit as a recorder to perform dubbing between the unit and another equipment connected, the format to be used for recording is set in accordance with [REC MODE] setting of [IN/OUT REC] menu.
For details, see the following table.
Playback and editing of a tape may be restricted for some dubbing methods. Read Chapter 3 "Dubbing/Editing" before dubbing a tape.
Some editing software can correctly edit even a tape created in [LOCK MODE]. In that case, select [LOCK MODE] if required.

Recording tapes used when the unit serves as a recorder

Input signal format	Menu item		Recording tape format (AUDIO MODE)
	REC MODE	AUDIO LOCK	
NTSC or PAL	DVCAM	—	DVCAM (LOCK MODE)
	DV SP	LOCK MODE	DV (LOCK MODE)
		UNLOCK MODE	DV (UNLOCK MODE)

— : Setting independent

Appendix

Dubbing with i HDV/DV jack

When you perform dubbing between the unit and digital video equipment connected with the i.LINK cable using the unit as a player, i HDV/DV jack output format is determined in accordance with the playback tape format and menu setting of the unit.
If you use the unit as a recorder, the format of a tape used for recording is determined in accordance with i HDV/DV jack input format and menu setting of the unit. For details, check the table on page 72.
Playback and editing using this tape may be limited for some dubbing methods. Before dubbing, read Chapter 3 "Dubbing/Editing".

i.LINK output when the unit is used as a player

Playback tape format	Menu item		i.LINK output format (AUDIO MODE)
	HDV/DV SEL	i.LINK SET HDV→DV CONV	
HDV	AUTO	OFF	HDV (LOCK MODE)
		DVCAM	DVCAM (LOCK MODE)
		DV (SP)	DV (UNLOCK MODE)
	HDV	OFF	HDV (LOCK MODE)
		DVCAM	DVCAM (LOCK MODE)
		DV (SP)	DV (UNLOCK MODE)
	DV	—	No output
DVCAM	AUTO	—	DVCAM (Complies with formats recorded in tapes)
	HDV	—	No output
	DV	—	DVCAM (Complies with formats recorded in tapes)
DV	AUTO	—	DV (Complies with formats recorded in tapes)
	HDV	—	No output
	DV	—	DV (Complies with formats recorded in tapes)

Notes

- When you play back a tape employed with a copy-protection signal on the unit, recording is prevented to record images from the unit to other equipment.
- You cannot up convert DVCAM(DV) format to HDV format on the unit.
- During playback in HDV, if [DV SP] is selected from [HDV→DV CONV] in [i.LINK SET], AUDIO MODE is fixed to UNLOCK MODE.
- When you play back a tape in DVCAM or DV format, the unit cannot convert between DVCAM and DV format, or switch between LOCK MODE and UNLOCK MODE.

Compatibility of HDV, DVCAM, and DV Formats

Recording tape when the unit is used as a recorder

i.LINK input format	Menu item		Recording tape format (AUDIO MODE)[3]
	HDV/DV SEL	REC MODE[1]	
HDV	AUTO	—	HDV (LOCK MODE)
	HDV	—	HDV (LOCK MODE)
	DV	—	No recording
DVCAM	AUTO	DVCAM	DVCAM (Complies with formats recorded in tapes)
		DV SP	DV (Complies with formats recorded in tapes)
	HDV	—	No recording
	DV	DVCAM	DVCAM (Complies with formats recorded in tapes)
		DV SP	DV (Complies with formats recorded in tapes)
DV	AUTO	DVCAM	DVCAM[2] (Complies with formats recorded in tapes)
		DV SP	DV (Complies with formats recorded in tapes)
	HDV	—	No recording
	DV	DVCAM	DVCAM[2] (Complies with formats recorded in tapes)
		DV SP	DV (Complies with formats recorded in tapes)

1) When the unit is used as a recorder, the recording format is determined by [REC MODE] setting in [IN/OUT REC] menu if the input signal format is DVCAM or DV.
2) If you duplicate a tape when the unit is set to DVCAM as a recorder, the time code format of the duplicated tape becomes somewhat different from the time code format specified as DVCAM (note, however, that this does not affect editing accuracy in special cases).
3) The unit cannot switch between LOCK MODE and UNLOCK MODE. AUDIO MODE complies with input signals.

Notes

- On the unit, HDV signals input from i.LINK cannot be down converted to DVCAM(DV) for recording.
- If you use the tapes described in 2) above for editing, you may encounter function limitations regardless of the player and recorder formats.
- Some DV video equipment may playback a DVCAM-formatted tape. Even if the tape is played back, the contents cannot be guaranteed. Therefore, if you use a proper DVCAM-formatted tape for playback, the unit may dub and create a DVCAM-formatted tape, the time code will be partially different from the time code format specified as DVCAM.
- You cannot use the unit to record video and audio delivering copyright signals. If you try to record such a video or audio, the message "Cannot record due to copyright protection." outputs from the analog video out jack. Pictures output from COMPONENT OUT jacks are switched to either 480i or 576i automatically, regardless of the menu you have set on the unit.
- When the video signals input from HDV/DV jack in HDV format are recorded, the user bit value is copied to the work tape. (The unit is not equipped with user bit settings and a user bit's display function.)

Limitations on editing

During editing, you will encounter limitations according to the format differences on a tape dubbed or edited using HDV/DV jack.
For details, refer to "Editing (Connecting with a Computer)" of Chapter 3, "Dubbing/Editing."

About i.LINK

i HDV/DV jack provided on the unit is an i.LINK-compliant jack. This section describes the i.LINK standard and its features.

What is i.LINK?

i.LINK is a digital serial interface for sending and receiving digital video, digital audio, and other data between the unit and other equipment equipped with an i.LINK terminal. You can also control other equipment using i.LINK.
i.LINK-compatible equipment can be connected using an i.LINK cable. Possible applications are operations and data exchange with various digital AV equipment. When two or more i.LINK-compatible equipment are connected to the unit, operations and data exchange are possible with equipment directly connected to the unit and also with equipment connected to the unit via other equipment.
Note, however, that the method of operation may vary depending on the characteristics and specifications of the equipment to be connected. Also, there are cases where operations and data exchange may not be possible even if the connection is made.

Notes

- Normally, only one equipment can be connected to the unit using the i.LINK cable. When you connect the unit to HDV/DVCAM (DV)-compliant equipment that allows multiple connections, refer to the operating instructions of the equipment to be connected.
- i.LINK is an easy-to-remember term for the IEEE 1394 proposed by Sony, and is a trademark approved by many corporations in Japan and overseas.
- IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

About the i.LINK baud rate

The maximum baud rate of i.LINK varies depending on the equipment. There are three types.

S100 (Approximately 100 Mbps*)
S200 (Approximately 200 Mbps)
S400 (Approximately 400 Mbps)

The baud rate is listed under "Specifications" in the operating instructions of individual equipment. It may be indicated near the i.LINK interface on some equipment.
The baud rate may vary from the indicated value when the unit is connected to equipment with a different maximum baud rate.

*What is Mbps?
Mbps stands for "megabits per second," or the volume of data that can be sent or received in 1 second. For example, a baud rate of 100 Mbps means that 100 megabits of data can be sent in 1 second.

To use i.LINK functions of the unit

For details on how to perform dubbing when the unit is connected to other video equipment that has an i.LINK jack, *see page 33, 37*.
The unit can also be connected to other i.LINK-compatible equipment made by Sony (i.e. a VAIO series computer) as well as video equipment.
The unit may not operate with some i.LINK video equipment such as digital televisions, DVD recorders/players, and MICROMV recorders/players even if they are equipped with i.LINK jack. Before connecting to another equipment, confirm whether this equipment is HDV/DVCAM (DV) compatible.
For details about precautions on connections and whether or not software applications compatible with the unit are available, refer to the operating instructions of the equipment to be connected.

Notes

- When you connect with the i.LINK cable to a computer and the unit, check the direction of the jack. If you forcibly insert the jack, the terminal may be damaged or cause the unit to malfunction. Allign ▲ mark of the i.LINK cable with ▼ mark on the unit and insert the i.LINK cable.
- Be sure to connect the i.LINK cable to a computer first and then connect it to the unit. If you connect the i.LINK cable to the unit first, it may cause the unit to malfunction because of static electricity.
- When you connect the unit to equipment equipped with a 6-pin type i.LINK jack, connect the cable to the 6-pin type i.LINK jack first.
- When you connect the unit to equipment equipped with a 6-pin type i.LINK jack using the i.LINK cable, power off the equipment and remove the power cord from the AC outlet before connecting (or disconnecting) the i.LINK cable. If the i.LINK cable is connected (or disconnected) while the equipment power cord is connected to the AC outlet, a high-voltage current (8 to 40 V) output from i.LINK jack of the equipment flows into the unit and damage it.

About required i.LINK cable

Use a Sony i.LINK cable.

Specifications

System

Video/Audio recording/playing Head System
Rotating dual-head helical scan

Audio recording format (HDV)
MPEG-1 Audio Layer2
16-bit 48 kHz (stereo)
Transfer rate 384 kbps

Audio recording format (DVCAM (DV))
12-bit Fs32K (Channel 1/2, Channel 3/4)
16-bit Fs48K (Channel 1/2)

Video signal: 1080/60i, NTSC color, EIA standard system
1080/50i, PAL color, CCIR standard system

Usable cassettes: Standard DVCAM cassettes with DVCAM™ mark
Mini DVCAM cassettes with DVCAM™ mark

Tape speed (HDV)
Approx. 18.812 mm/s

Tape speed (DVCAM)
Approx. 28.218 mm/s

Tape speed (DV): Approx. 18.812 mm/s

Recording/playback time (HDV)
Approx. 276 min (using PHDV-276DM)
Approx. 63 min (using PHDVM-63DM)

Recording/playback time (DVCAM)
Approx. 184 min (using PHDV-276DM)
Approx. 41 min (using PHDVM-63DM)

Recording/playback time (DV SP)
Approx. 276 min (using PHDV-276DM)
Approx. 63 min (using PHDVM-63DM)

AUDIO jacks

IN: Pin jack: –10 dBu
Impedance: Minimum 10 kΩ (kilo ohms), unbalanced
Maximum input level:
+16 dBu (approx. 5 Vrms) 60i system
+14 dBu (approx. 4 Vrms) 50i system

OUT: Pin jack
Impedance: Maximum 1 kΩ (kilo ohms)
Output level: 47 kΩ (kilo ohms) loading, unbalanced
–10 dBu (= full bit –20 dB) 60i system
–10 dBu (= full bit –18 dB) 50i system

VIDEO jacks

IN/OUT: Pin jack, unbalanced
1.0 Vp-p (75 Ω (ohms), sync negative)
Sync signal:
0.286 Vp-p (60i/NTSC)
0.3 Vp-p (50i/PAL)
Burst signal:
0.286 Vp-p (60i/NTSC)
0.3 Vp-p (50i/PAL)

S VIDEO jacks

IN/OUT: Mini DIN 4-pin, unbalanced
Luminance signal:
1.0 Vp-p (75 Ω (ohms), sync negative)
Sync signal:
0.286 Vp-p (60i/NTSC)
0.3 Vp-p (50i/PAL)
Chrominance signal:
0.286 Vp-p (60i/NTSC) (burst, 75 Ω (ohms))
0.3 Vp-p (50i/PAL) (burst, 75 Ω (ohms))

COMPONENT OUT jacks

OUT Pin jack

Output at 480i NTSC

With [BETACAM] selected in [IN/OUT REC] menu

Y: 1.0 Vp-p
(with 0.286 Vp-p sync negative, output impedance 75 Ω (ohms), unbalanced)

Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p
(output impedance 75 Ω (ohms), unbalanced)
(75% color bars with 7.5 IRE setup)

With [SMPTE] selected in [IN/OUT REC] menu

Y: 1.0 Vp-p
(with 0.3 Vp-p sync negative, output impedance 75 Ω (ohms), unbalanced)

Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p
(output impedance 75 Ω (ohms), unbalanced)
(100% color bars with no setup)

Output with other settings

Y: 1.0 Vp-p
(output impedance 75 Ω (ohms), unbalanced)

Pb/Cb/B-Y, Pr/Cr/R-Y: 0.7 Vp-p
(output impedance 75 Ω (ohms), unbalanced)
(100% color bars with no setup)

480i/480p:
Y: with 0.3 Vp-p sync negative

1080i:
Y/Pb/Pr: with 0.6 Vp-p 3-level sync

i. HDV/DV jack

i.LINK (IEEE1394, 4-pin connector S100)

Remote control

LANC Stereo mini-minijack (ø 2.5)

CONTROL S IN Stereo minijack (ø 3.5)

General

Peak inrush current
Hot switching inrush current, measured in accordance with European standard EN55103-1 : 5.0 A (230 V)

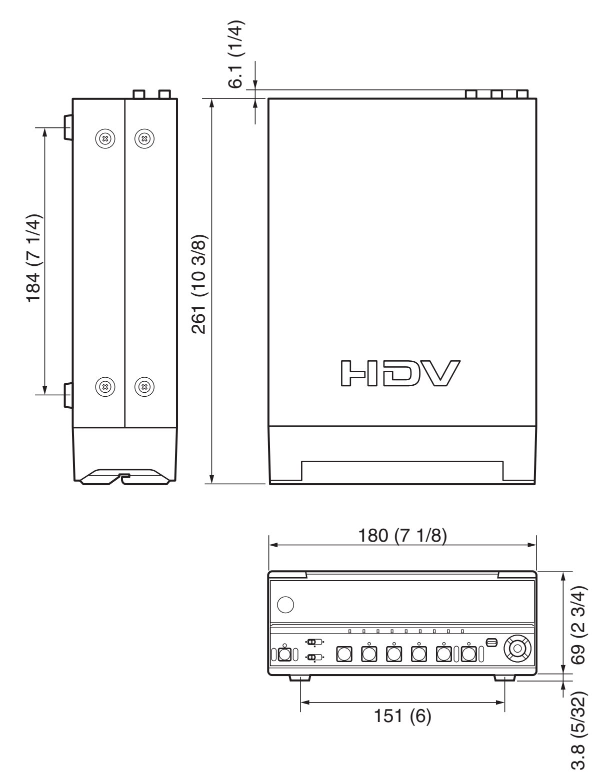
Power requirements
8.4 V (DC IN jack)

Power consumption
8 W (during playback)

Operating temperature
5 ˚C to 40 ˚C (41 ˚F to 104 ˚F)

Storage temperature
–20 ˚C to +60 ˚C
(–4 ˚F to +140 ˚F)

Dimensions Approx. 180 × 72.8 × 267.1 mm (7 1/8 × 2 7/8 × 10 5/8 inches) (w/h/d, including projecting parts and controls)



Mass Approx. 2.3 kg (5 lb. 1 1/8 oz.)

(Continued)

Specifications

Supplied accessories
    Remote Commander (1)
    AC adaptor (1)
    Power cord (1)
    Rack (1)
    Size AA batteries (2)
    Cleaning cassette (1)
    Operating instructions (1)

AC adaptor

Power requirements
    100 – 240 V AC, 50/60 Hz
Current consumption
    0.35 – 0.18 A
Power consumption
    18 W
Output voltage
    DC OUT: 8.4 V *
Operating temperature
    0 ˚C to 40 ˚C (32 ˚F to 104 ˚F)
Storage temperature
    –20 ˚C to +60 ˚C (–4 ˚F to +140 ˚F)

* See the label on the AC adaptor for other specifications.

Design and specifications are subject to change without notice.

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http://www.sony.net/

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free vegetable oil based ink.

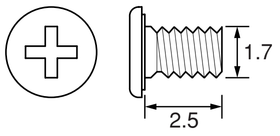
Printed in Japan

GB

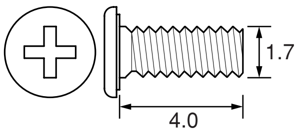
2678753110

HARDWARE LIST (1/3)

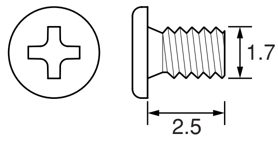
#1: M1.7 X 2.5
(Black)
2-635-562-11



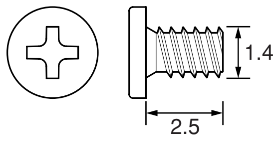
#2: M1.7 X 4.0
(Black)
2-635-562-31



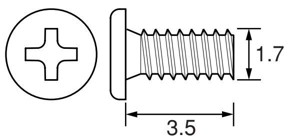
#3: M1.7 X 2.5
(Red)
2-660-401-01



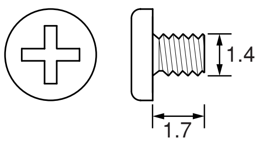
#4: M1.4 X 2.5 (Tapping)
(Dark Silver)
3-348-998-81



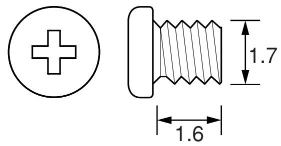
#5: M1.7 X 3.5 (Tapping)
(Black)
3-080-204-01



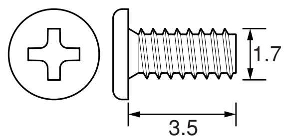
#6: M1.4 X 1.7
(Silver)
2-598-474-01



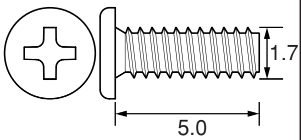
#7: M1.7 X 1.6
(Black)
7-627-552-18



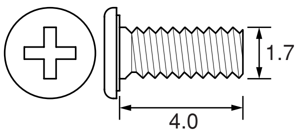
#8: M1.7 X 3.5 (Tapping)
(Silver)
3-078-890-01



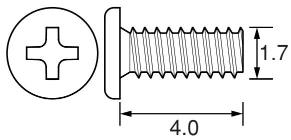
#9: M1.7 X 5.0 (Tapping)
(Silver)
3-078-890-21



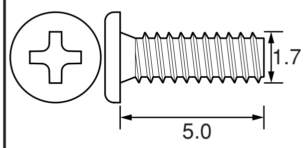
#10: M1.7 X 4.0
(Silver)
2-599-475-31



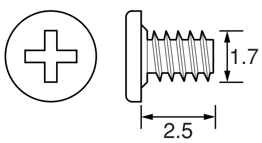
#11: M1.7 X 4.0 (Tapping)
(Silver)
3-078-890-11



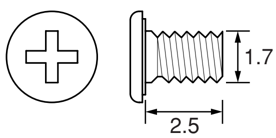
#12: M1.7 X 5.0 (Tapping)
(Black)
3-080-204-21



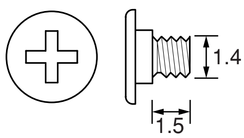
#13: M1.7 X 2.5 (Tapping)
(Silver)
3-085-397-01



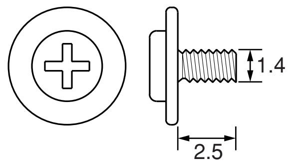
#14: M1.7 X 2.5
(Silver)
2-599-475-11



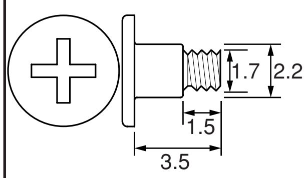
#15: M1.4 X 1.5
(Silver)
3-062-214-01



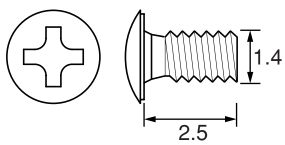
#16: M1.4 X 2.5
(Silver)
2-586-337-01



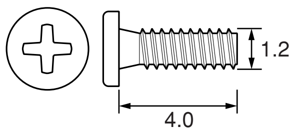
#17: M1.7 X 1.5
(Silver)
2-586-389-01



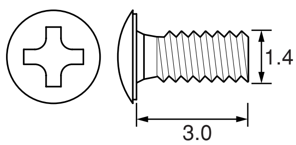
#18: M1.4 X 2.5
(Silver)
2-635-591-21



#19: M1.2 X 4.0 (Tapping)
(Red)
3-086-156-21

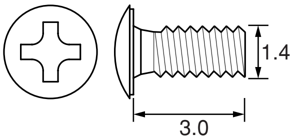


#20: M1.4 X 3.0
(Silver)
2-635-591-31

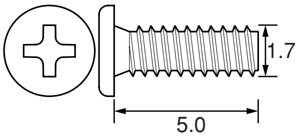


HARDWARE LIST (2/3)

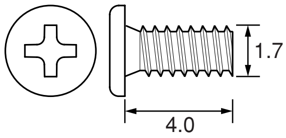
#21: M1.4 X 3.0
(Black)
2-662-396-21



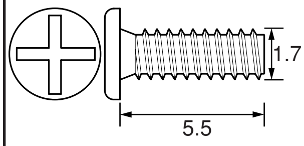
#22: M1.7 X 5.0 (Tapping)
(Silver)
3-083-261-01



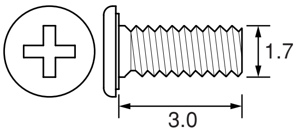
#23: M1.7 X 4.0 (Tapping)
(Black)
3-080-204-11



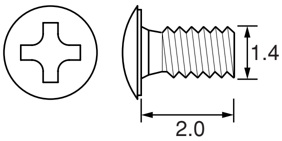
#24: B1.7 X 5.5 (Tapping)
(Black)
4-679-805-11



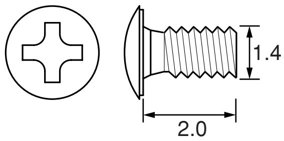
#25: M1.7 X 3.0
(Black)
2-635-562-21



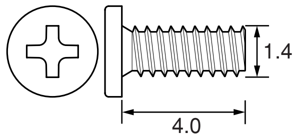
#26: M1.4 X 2.0
(Silver)
2-635-591-11



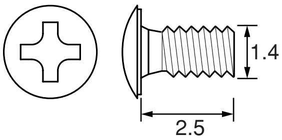
#27: M1.4 X 2.0
(Black)
2-662-396-11



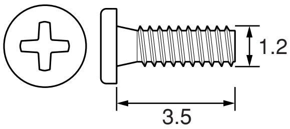
#28: M1.4 X 4.0 (Tapping)
(Dark Silver)
3-348-998-61



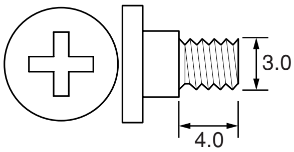
#29: M1.4 X 2.5
(Black)
2-662-396-01



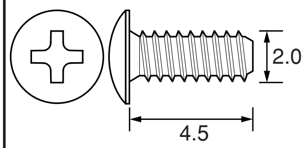
#30: M1.2 X 4.0 (Tapping)
(White)
3-086-156-11



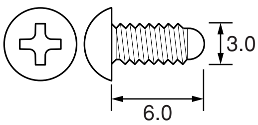
#31: M3.0 X 4.0
(Silver)
2-102-434-01



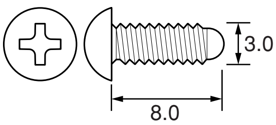
#32: M2.0 X 4.5 (Tapping)
(Silver)
2-102-498-01



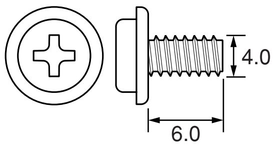
#33: M3.0 X 6.0
(Silver)
3-077-331-21



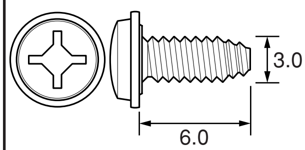
#34: M3.0 X 8.0
(Black)
3-077-331-41



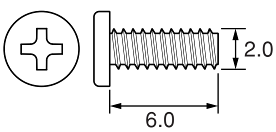
#35: M4.0 X 6.0 (Tapping)
(Silver)
3-975-291-02



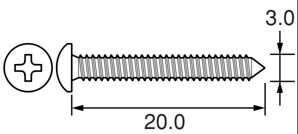
#36: M3.0 X 6.0
(Silver)
4-886-821-11



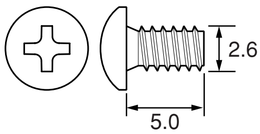
#37: M2.0 X 6.0 (Tapping)
(Black)
3-080-206-31



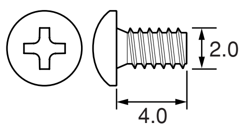
#38: M3.0 X 20.0 (Tapping)
(Silver)
7-685-651-79



#39: M2.6 X 5.0 (Tapping)
(Black)
7-685-791-09

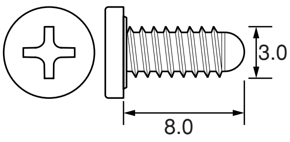


#40: M2.0 X 4.0 (Tapping)
(Silver)
7-685-851-04

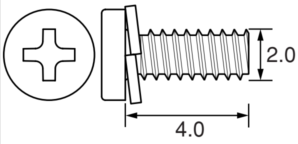


HARDWARE LIST (3/3)

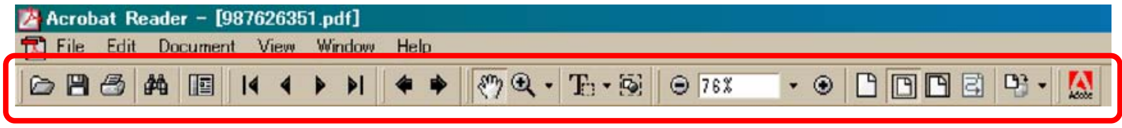
#41: M3.0 X 8.0 (Tapping)
(Silver)
3-065-748-01



#42: M2.0 X 4.0 (Tapping)
(Silver)
7-628-253-00



[Description of main button functions on toolbar of the Adobe Acrobat Reader Ver5.0 (for Windows)]



Toolbar

Printing a text

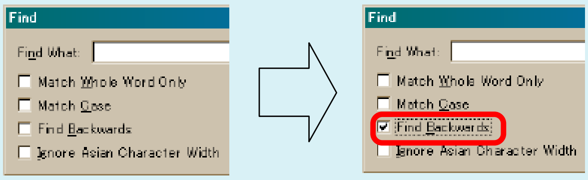
1. Click the Print button .
2. Specify a printer, print range, number of copies, and other options, and then click [OK].

Application of printing:
To set a range to be printed within a page, select the graphic selection tool and drag on the page to enclose a range to be printed, and then click the Print button.

Finding a text

1. Click the Find button .
2. Enter a character string to be found into a text box, and click the [Find]. (Specify the find options as necessary)

Application to the Service Manual:
To execute "find" from current page toward the previous pages, select the check box "Find Backward" and then click the "Find".



3. Open the find dialog box again, and click the [Find Again] and you can find the matched character strings displayed next. (Character strings entered previously are displayed as they are in the text box.)

Application to the Service Manual:
The parts on the drawing pages (block diagrams, circuit diagrams, printed circuit boards) and parts list pages in a text can be found using this find function. For example, find a Ref. No. of IC on the block diagram, and click the [Find Again] continuously, so that you can move to the Ref. No. of IC on the circuit diagram or printed circuit board diagram successively.
Note: The find function may not be applied to the Service Manual depending on the date of issue.

Switching a page

- To move to the first page, click the .
- To move to the last page, click the .
- To move to the previous page, click the .
- To move to the next page, click the .

Reversing the screens displayed once

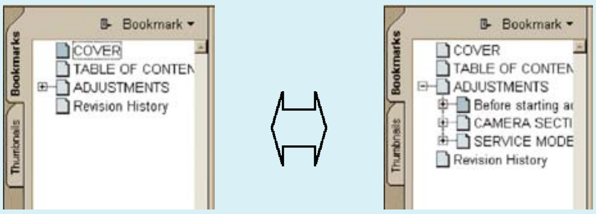
- To reverse the previous screens (operation) one by one, click the .
- To advance the reversed screens (operation) one by one, click the .

Application to the Service Manual:
This function allows you to go and back between circuit diagram and printed circuit board diagram, and accordingly it will be convenient for the voltage check.

Moving with link

1. Select either palm tool , zoom tool , text selection tool , or graphic selection tool .
2. Place the pointer in the position in a text where the link exists (such as a button on cover and the table of contents page, or blue characters on the removal flowchart page or drawing page), and the pointer will change to the forefinger form .
3. Then, click the link. (You will go to the link destination.)

Moving with bookmark:
Click an item (text) on the bookmark pallet. and you can move to the link destination. Also, clicking ⊞ can display the hidden items.
(To go back to original state, click ⊟)



Zooming or rotating the screen display

"Zoom in/out"

- Click the triangle button in the zoom control box to select the display magnification. Or, you may click or for zooming in or out.

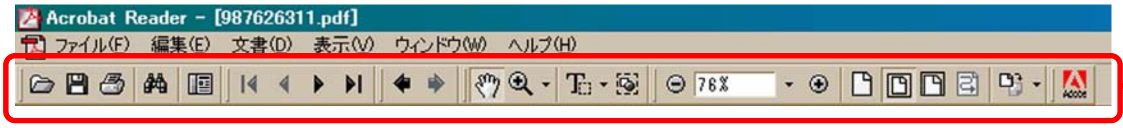


"Rotate"

- Click rotate tool , and the page then rotates 90 degrees each.

Application to the Service Manual:
The printed circuit board diagram you see now can be changed to the same direction as the set.

【Adobe Acrobat Reader Ver 5.0（for Windows）ツールバー内にある主なボタンの機能説明】



ツールバー

文章を印刷する

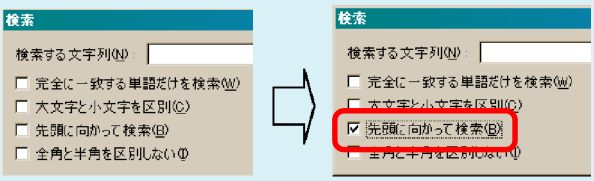
1. 印刷ボタン をクリックする。
2. プリンター、印刷範囲、印刷部数、および他のオプションを指定して「OK」をクリックする。

印刷の応用：
ページ内で印刷したい範囲を設定するには、グラフィック選択ツール を選択し、ページ上をドラッグして印刷したい範囲を囲んでから印刷ボタンをクリックする。

文章内を検索する

1. 検索ボタン をクリックする。
2. 検索したい文字列をテキストボックスに入力して「検索」をクリックする。（必要に応じて検索オプションを指定する）

サービスマニュアルへの応用：
現在のページから前ページに向かって検索する場合は「先頭に向かって検索」のチェックボックスを選択してから「検索」をクリックする。



3. 検索ダイアログボックスをもう一度開き、「次を検索」をクリックすると次に出てくる一致文字列を検索することができる。（前回入力した文字列が、テキストボックスにそのまま表示されている）

サービスマニュアルへの応用：
文章内にある図面ページ（ブロックダイヤグラム、回路図、プリント図）および部品表ページなどは、この検索機能を使って部品検索することができる。例えば、ブロックダイヤグラム上でICのRef. No.を検索し、「次を検索」を続けることによって回路図、プリント図上にあるICのRef. No.へ次々と移動する。
注意：発行年月日によって検索できない場合もあります。

ページを切り換える

- 最初のページに移動する場合、 をクリックする。
- 最後のページに移動する場合、 をクリックする。
- 前のページに移動する場合、 をクリックする。
- 次のページに移動する場合、 をクリックする。

一度表示した画面へ逆戻りする

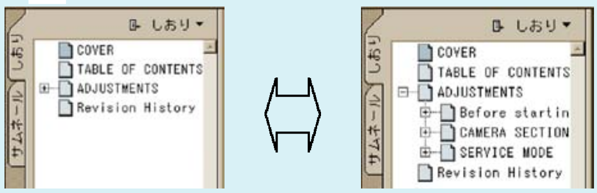
- 前の画面（操作）へ1つずつ逆戻りする場合、 をクリックする。
- 戻した画面（操作）を1 つずつ前に進める場合、 をクリックする。

サービスマニュアルへの応用：
回路図とプリント図を行き来できるので電圧チェックに便利です。

リンクを使用して移動する

1. 手のひらツール 、ズームツール 、テキスト選択ツール 、グラフィック選択ツール のいずれかを選択する。
2. 文章内のリンクのある場所（表紙および章目次ページのボタン、外し方のフローページ、図面ページでは文字が青色になっているところなど）にポインタを置くと、ポインタが人差し指の形「 」に変わる。
3. そのままリンクをクリックする。（リンク先へ移動する）

しおりを利用して移動する：
しおりパレット上の項目（テキスト）をクリックするとリンク先へ移動することができる。また、「⊞…」をクリックすると隠れている項目を表示することができる。
（「⊟…」をクリックすると元に戻る）



画面の表示を拡大、縮小または回転させる

「拡大/縮小」

- 倍率ボックスの三角矢印ボタンをクリックし、表示倍率を選択する。または 、 をクリックしても使えます。



「回転」

- 回転ツール をクリックすると、ページが90度ずつ回転する。

サービスマニュアルへの応用：
見ているプリント図をセットと同じ向きに変えられます。

Revision History

Ver.	Date	History	Contents	S.M. Rev. issued
1.0	2006.05	Official Release	—	—
1.1	2006.08	Supplement-1 (S1 DI06-047)	• Change of Repair Parts	No
1.2	2006.12	Correction-1 (C1)	• Correction of Repair Parts S.M. correction: Page 5-7, Page 5-8, Page 5-27	Yes